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FINAL REPORT
SPACE STATION/BASE FOOD SYSTEM STUDY

VOLUME II
SYSTEMS ASSESSMENTS

Prepared for

NATIONAL AERONAUTICS and SPACE ADMINISTRATION

Manned Spacecraft Center
Houston, Texas 77058

Contract NAS9-11139
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Prepared by
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ABSTRACT

The Fairchild Hiller Corporation, Republic Aviation Division, performed a seven-month study under Contract Number NAS9-11139 entitled "Space Station/Base Food System Study" for the National Aeronautics and Space Administration, Manned Spacecraft Center. The study was conducted so as to identify and define engineering data for a spectrum of possible items and equipment comprising potential food systems for use on manned spacecraft and assemble these data in a Final Report and Data Book.

This document is Volume II of the Final Report. The Final Report summarizes the results of this study and has been prepared in two volumes:

Final Report - Volume I - Systems Design Handbook

This volume contains the study approach used in performance of the contract effort; the study results containing the candidate concepts considered and technical data, performance characteristics, and sketches for each of the concepts by functional area; human factors considerations for crew tasks; shuttle supply interface requirements; special food system study areas; and recommendations/conclusions based on the study results.

Final Report - Volume II - Systems Assessment

This volume describes the evaluation modeling technique used to combine the candidate element concepts into systems that meet mission requirements. Results of this assessment are presented in terms of systems performance data and plots of system trade-off data by highest ranking variable. Note: Section IV of this volume is bound under separate cover.

The engineering Data Book supplements the Final Report and includes the detailed technical data sheets, supporting analysis and selection rationale for each of the concepts considered in the final study.

The contract effort was performed under the technical direction of Mr. Dean Glenn, Habitability Technology/Spacecraft Design Office of the Manned Spacecraft Center.

SECTION I

INTRODUCTION AND SUMMARY

The purpose of the Food System Study conducted by Fairchild Hiller was to identify and define characteristic concepts, performance requirements, quantitative requirements, functional features, and engineering data for a spectrum of possible items or systems.

Volume I of the Final Report and the Data Book presented detail data on concept elements. This volume compiles these data in systems assessments so as to evaluate overall performance characteristics. Approximately 120 individual basic concepts were studied in detail in the final study phase. Each of these concepts generated multiple data sheets, since the quantified parameters vary as a function of mission requirements. Over 800 data sheets, therefore, were prepared during the Interim study phase and carried into the Final study. In order to assess this amount of information, a computer program was developed that would synthesize these data into potential food systems that would meet program requirements.

The modeling technique utilized is described in Section II of this volume. The approach, model description, and model usage are explained to assist the designer in taking full advantage of the capabilities and options available with the evaluation technique. The balance of this volume of the Final Report contains the systems performance data and parametric assessments produced by the model for selected missions.

Note: Section IV of this volume, which contains the detailed food system model run results, is bound under separate cover due to the size of the computer print-out sheets.

SECTION II
STUDY APPROACH

A. OBJECTIVES

The primary objective of the food systems assessment study was to determine feasible food systems from the potential equipments and to evaluate them. In order to accomplish this, the following study objectives were established:

1. Determination of Potential Food Systems

   The synthesis of the various admissible functional subsystems into potential food systems which will perform all the necessary functions.

2. Determination of System Requirements

   The determination of the total system requirements for each of the potential food systems for each mission considered. These requirements include installed weight and volume, peak power and energy, resupply weight and volume, cost including both development and acquisition, input water, both hot and cold, galley crew manhours and development risk.

3. Determination of Systems Performance and Costs

   The determination of the total system performance and costs for each of the potential food systems for each mission considered. The parameters to be computed include reliability, maintainability, crew acceptance, availability and safety.

4. Automatic and Rapid Evaluation

   The performance of automatic and rapid food system formulation and evaluation with an automated evaluation model. This permits concentration of the study's efforts on concept definition and parameter evaluation.

5. Automated Results Summary and Presentation

   Automatic summarization and presentation of the results for each mission to consist of lists of the characteristics of each admissible system, of system ranking by selected characteristics, and of charts of selected variable versus another selected variable. In addition, those systems meeting various inputted constraints are to be automatically obtained.

B. APPROACH

The study approach was to formulate a model which would construct and evaluate feasible food systems from data describing potential equipments, concepts and requirements. The model would accept as input the requirements and performance of the potential equipments and compute feasible system requirements and performance. The model would be programmed for the digital computer to permit rapid and automatic usage. The following is a brief description of the results of this approach:

1. Model Inputs

The inputs to the model consist of the performance and requirement values for each equipment. These are the values of crew acceptance, weight, volume, and peak power requirements, cost, failure rate, operating times, safety rate, resupply weight, resupply volume, energy requirement, crew requirements, hot water requirements, cold water requirements, and development risk. In addition, the data necessary to determine the possible functional subsystems and the mutual compatibility of the functional subsystems are inputted. A simplified technique is utilized to input all the data which define both the mutually exclusive and necessary functional subsystems.

2. Basic Model

The basic model accepts the above inputs and computes optimal compatible systems for the mission implied by the inputs and a given optimizing performance index. Each system has one functional subsystem for each functional area and the functional subsystems selected for each system are mutually compatible. For each system, the requirements and performance are computed, including crew acceptance, weight, volume, peak power requirements, cost, failure rate, reliability, repair rate, safety rate, resupply weight, resupply volume, energy requirements, hot water requirements, cold water requirements, development risk and availability. Any subset of this group of system characteristics can be omitted from a particular run, if desired.

3. Evaluation Link

This program link performs the computation of all the compatible systems which meet a given set of constraints. The constraints can consist of values for any group of the system characteristics described under the basic model. In addition, the compatible systems can be ordered by any one of the system characteristics.

4. Plotting Link

This program link automatically charts the values of system characteristics considering all of the compatible systems. Any two characteristics can be cross plotted; thus cost versus reliability, weight versus availability, etc. can be obtained.

C. MODEL DESCRIPTION

The logical composition of the food systems evaluation model is shown in Figure II-1 and is described below.

1. Input

The model input consists of the following:

a. For each potential equipment i, (for a given mission):

1) The associated function for which the equipment will be used. This is a number from 1 to 7, where:

1 - Food Provision
2 - Food Storage
3 - Food Preparation
4 - Food Serving
5 - Food Consumption
6 - Food Clean-Up
7 - Food Recording

2) The crew acceptance rating for the equipment. This will be a number from 1 - 8, where an 8 indicates maximum acceptance. The symbol, A_i, is used to denote the acceptance rating of equipment i.

3) The installed weight of the equipment, W_i, in pounds. By definition, this weight will not include consumables which will be included in the resupply weight, described below.

4) The installed volume of the equipment, V_i, in cubic feet. Similarly, this volume will not include consumables.

5) The total power requirements for the system, P_i, in watts.

6) The total cost of the equipment, C_i, in thousands of dollars. This value will be the total of the development, procurement, and installation costs.

7) The failure rate of the equipment, λ_i, in failures per hour. This value is the reciprocal of the mean time to failure, MTBF.

8) The equipment operating time per mission, T_i, in hours.

9) The average rate of repair, given a failure, for the equipment, μ_i, in repairs per hour. This value is the reciprocal of the mean time to repair, MTTR.

10) The equipment accident rate, i.e., the rate of occurrences of incidences which may result in unsafe conditions, S_i, in accidents per hundred thousand hours.

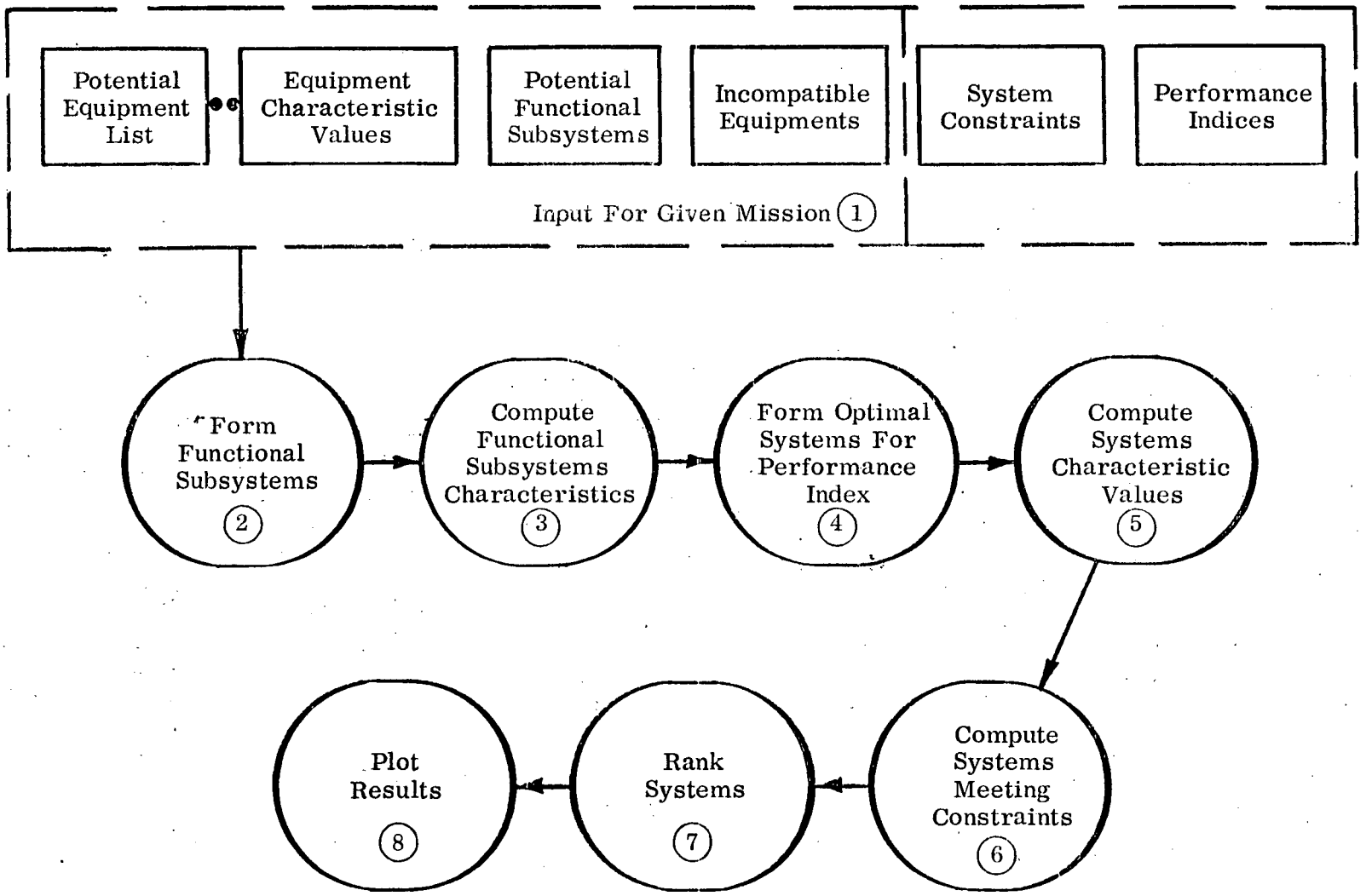


Figure II-1. Food System Evaluation Model - Model Description

11) The equipment resupply weight requirement, W'_i, in pounds. This is the total resupply weight required per resupply period including expendables and spares.

12) The equipment resupply volume requirement, V'_i, in cubic feet. This is the total resupply volume required per resupply period including expendables and spares.

13) The equipment daily energy requirement, E_i, in watt-hours per day. This is the daily consumption of energy in watt-hours/day.

14) The crew operating time daily requirement for the equipment, M_i, in manhours per day. This is the value of manhours per day required to operate and maintain the equipment.

15) The daily hot water requirements for the equipment, H_i, in pounds per day. This is the demand in pounds of water at 150°F per day.

16) The daily cold water requirement for the equipment $(CW)_i$, in pounds per day. This is the demand in pounds of water at 50°F per day.

17) The development risk for the equipment, $(DR)_i$. This will be a number assigned to the equipment as follows:

<.9	Major development required or development not feasible
.9 - .95	Broad development required
.95 - .99	Some development
.99 - 1	Available

b. In any given run of the model, any subset of the above 16 equipment characteristics may be eliminated from the analysis by designating the characteristics which are not to be considered.

c. Each mission function, described in a. 1) above, is further divided into subfunctions and for each subfunction, the equipments which can satisfy the subfunction is inputted.

d. All, if any, incompatible pairs of equipment are inputted. This will automatically stop the program from forming any food systems containing a pair of incompatible equipments.

e. System performance and/or requirement constraints can be inputted, if desired. These can consider any subgroup of the system characteristics. Thus, cost, availability, weight, etc., values can be set for the systems and all systems meeting these values will be determined.

f. The performance indices for which the systems formed are to be optimized and the number of systems to be formed for each index are inputted. The performance index is of the form:

$$\text{Index} = \sum_{I} W(I) \text{ X char } (I) \text{ where}$$

W(I) = weighting factor for system characteristic I and

char (I) = system characteristic I.

The system characteristics can be any of the 17 system characteristics computed by the model, including system weight, volume, cost, availability, power, etc. Thus, typical performance indices can be minimum weight, minimum cost, maximum availability and minimum weight plus volume.

2. Formation of Potential Functional Subsystems

For each of the 7 functions, described in C.1. above, the potential subsystems that can perform the function are formed. Each subsystem consists of a group of equipments.

3. Computation of Functional Subsystem Characteristics

For each of the functional subsystems formed, the values of the performance and requirements' characteristics are computed from the equipments input values. The general equations used for each characteristic areas are as follows:

a. Subsystem crew acceptance measure, $A^S = \sum_{i=1}^{ne} A_i/ne$ where:

ne is the number of equipments in the subsystem and i is the subscript denoting an equipment.

b. Subsystem installed weight, $W^S = \sum_i W_i$

c. Subsystem installed volume, $V^S = \sum_i V_i$

d. Subsystem peak power requirement, $P^S = \sum_i P_i$

e. Subsystem mission cost, $C^S = \sum_i C_i$

f. Subsystem failure rate, $\lambda^S = \sum_i \lambda_i$

g. Subsystem mission reliability, $R^S = \prod_i e^{-T_i \lambda_i}$ where

T_i = mission operating time for equipment i

h. Subsystem maintainability measure, $\mu^S = \dfrac{ne}{\sum_i \frac{1}{\mu_i}}$

i. Subsystem safety rate, $S^S = \sum_i S_i$

j. Subsystem resupply weight per resupply period, $W'^S = \sum_i W'_i$

k. Subsystem resupply volume per resupply period, $V'^S = \sum_i V'_i$

l. Subsystem daily energy requirement, $E^S = \sum_i E_i$

m. Subsystem daily crew operating time requirement, $M^S = \sum_i M_i$

n. Subsystem daily hot water requirement, $H^S = \sum_i H_i$

o. Subsystem daily cold water requirement, $(CW)^S = \sum_i (CW)_i$

p. Subsystem development risk, $(DR)^S = \prod_i (DR)_i$

4. Formation of Optimal Systems

Based on the inputted performance index, the optimal systems are determined. The optimizing logic consists of the following:

a. For each function, the subsystems are ordered according to the selected performance index, with subsystem number 1 being the most desirable, subsystem number 2 being the next most desirable, etc.

b. The group of optimal systems is then formed by creating all of the systems from the subsystems ranked 1, 2, ... n in each functional category. Each system consists of seven subsystems, one from each functional category. At present, n has been set to 2, so that 2^7 or 128 different systems are formed whenever there are no ties in the subsystems rankings. When ties are present, the additional systems are formed, up to a maximum of 1950, at which point the systems formation routine is truncated.

In this systems formation routine, each system is checked for incompatible equipments, and if any are present, the system is discarded from further consideration.

5. Computation of System Characteristic Values

The value of each system's performance and requirements characteristics are computed from the functional subsystem's values, using the general equations given above under 3. Maintainability is not computed for the systems; it is replaced by availability, defined as:

$$(AV)^S = \frac{\mu^S}{\lambda^S + \mu^S}$$

6. Computation of Systems Meeting Constraints

For a given set of input constraints on the system performance and/or requirements, the system meeting or exceeding these values are obtained. Any group of constraints can be considered; for example, the systems which have a reliability greater than R, a cost less than C, and a total installed weight of less than W can be readily determined.

7. Systems Ranking

The systems are ordered by any chosen characteristic and repeated orderings, by different characteristics, can be readily performed. Thus, the systems can be ranked by increasing weight, by decreasing availability, by increasing cost, etc., successively.

8. Charting of the Results

Two-variable plots are obtained for any chosen abscissa and ordinate from the group of system characteristics. Successive plots of varying abscissa and ordinates are readily obtained. Thus, curves of weight versus cost, volume versus energy, crew acceptance versus cost, etc., are possible outputs of this stage.

D. EVALUATION MODEL APPLICATIONS

The evaluation model, described above, provides a versatile means of determining and evaluating the potential food systems. In particular, the following are recommended methods of employing the model.

1. Determination of Admissible Food Systems

Direct usage of the basic model will yield the list of admissible (all functional subsystems compatible) systems, the system composition in terms of equipment and functional subsystems and the values of the requirements and performance for each functional subsystem and system. Inputs describing the potential equipments are needed; however, complete inputs describing every equipment characteristic are not necessary to obtain meaningful results. It is recommended that initial model usage include only 4 or 5 of the more critical characteristics to more rapidly determine the concepts which merit further study.

2) Determination of System Tradeoff Data

For a given mission, direct use of the model and the plotting link will yield trade data and curves for the system requirements and performance values. These are trades among the various potential admissible systems; for example, the trade between cost and installed weight or between availability and development risk considering all the admissible systems for a given mission. In addition, trade data for different missions can be obtained by cross plotting the results of each mission. This model has been used to develop trade data as presented in Section V, below.

3) Determination of Systems Meeting Constraints

For a given mission, direct use of the model will yield the particular systems (and their requirement and characteristic values) which meet or exceed any set of characteristic constraints. This application will greatly assist the system designer as it will filter out all the potential systems which exceed any predetermined limits and permit emphasis to be placed upon only those systems within these limits.

4) Determination of "Best" Systems

The determination of the optimum system for a given mission is largely subjective because of the difficulty of combining into one meaningful measure the various system evaluators such as: cost, availability, weight, etc. However, a "best" system in a restricted sense can be determined by the use of the evaluation model as follows:

a) For a given mission, the values of all variables except for a chosen one which will be used as the system evaluator, are constrained. Thus, for example, if cost is selected as the system evaluator, a constraining value is set for all of the other characteristics.

b) The evaluation model is exercised to determine the value of the system evaluator (cost, in the above example) for each admissible system satisfying the constraints.

c) The system with the best value of the system evaluator (lowest cost, in the above example) from the admissible systems meeting the constraints is adjudged to be the "best" system for the given mission. In the example, the system with lowest cost yet satisfying the constraint values of availability, weight, volume, etc. would be selected.

A repeated application of this technique, changing the system evaluator in each application will enable the food system designer to assess the various system options available. It is recommended that the model be utilized in this fashion after the completion of the detailed study of potential food system concepts.

E. MODEL USE INSTRUCTIONS

The detailed instructions for using the evaluation model are given below. This consists of the input data required, the IBM card formats for this data and a general description of the output. The model FORTRAN card decks are supplied and the program listings are supplied in the Appendix of this volume.

1. Basic Program Input and Output Description

a. Input

1) Candidate Equipment Characteristics, namely:

a) Study #
b) Name
c) Function
d) Crew acceptance
e) Weight
f) Volume
g) Power requirements
h) Cost
i) Failure rate
j) Operating time
k) Maintainability rate
l) Safety rate
m) Resupply weight per resupply mission
n) Resupply volume per resupply mission
o) Energy requirements
p) Crew manhours requirements
q) Hot water requirements
r) Cold water requirements
s) Development risk

2) Equipment composing the vaious candidate equipment lists that can perform each subfunction

3) The pairs of equipment that are mutually incompatible in the same system

4) The performance indices that are to be used in selecting the systems to be formulated.

5) The IBM card formats for this data are given in Figure II -2. In this figure:

a) Each required input card is described by the rows in this figure. The necessary order of the cards is as indicated. A single headed arrow signifies that the input is an integer, end-adjusted in the column of the arrow head and an arrow with heads at either end signifies a floating point number requiring a decimal point in the field encompassed by the arrow heads or a message (title or other data) to be inserted anywhere within the arrow heads.

b) IPNTG, IPPAIR, IPSYS, IPNSYS, IPEQ, and IPCNC are intermediate print triggers such that:

(1) If all are zero, no intermediate print is produced

(2) If one or more are non-zero, intermediate print is triggered from different points in flow.

c) IPSØUT is a system table print trigger.
If IPSØUT = 1, then table of food system characteristics is printed
If IPSØUT = 0, then table of food system characteristics is not printed

d) Mission title is input as desired and is used as mission title in Basic Model and gets passed to both evaluation and plot links for use there. In plot link, it gets used as plot title for plot for that case. This card must be supplied for each mission.

e) NRCASE is the mission number. It is used in tables' print-out and get passed to evaluation and plot links. This card must be supplied for each mission.

f) NX is the number of characteristics not to be considered. It must be an integer between 0 and 10. This card must be supplied for each mission: if no characteristics are to be omitted, set NX = 1 and IDUM(I) = 10.

g) IDUM(J) is the characteristic number associated with omitted variable #J, (J = 1, 2, ..., NX),

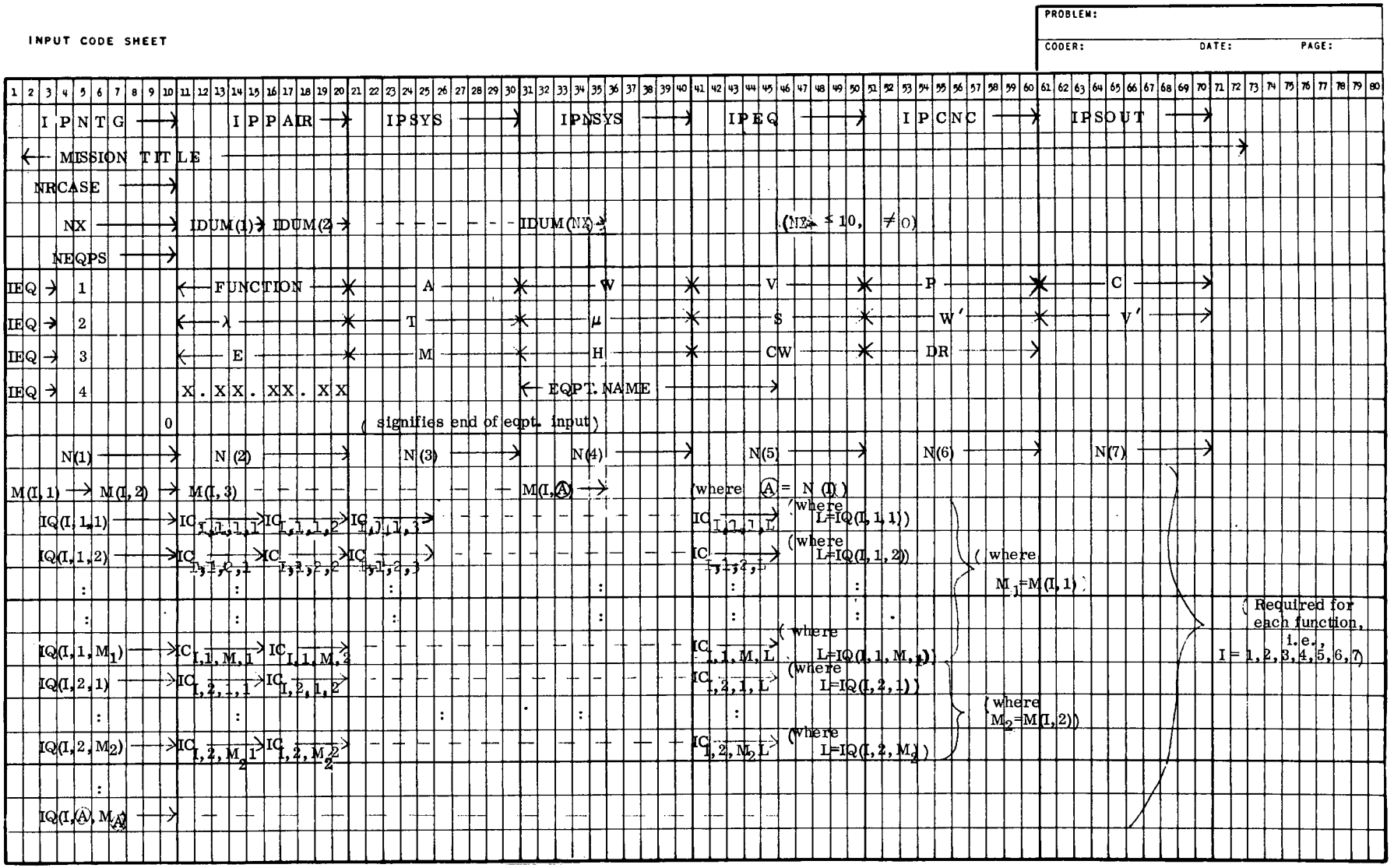


Figure II-2. Food System Evaluation Basic Model Input Format

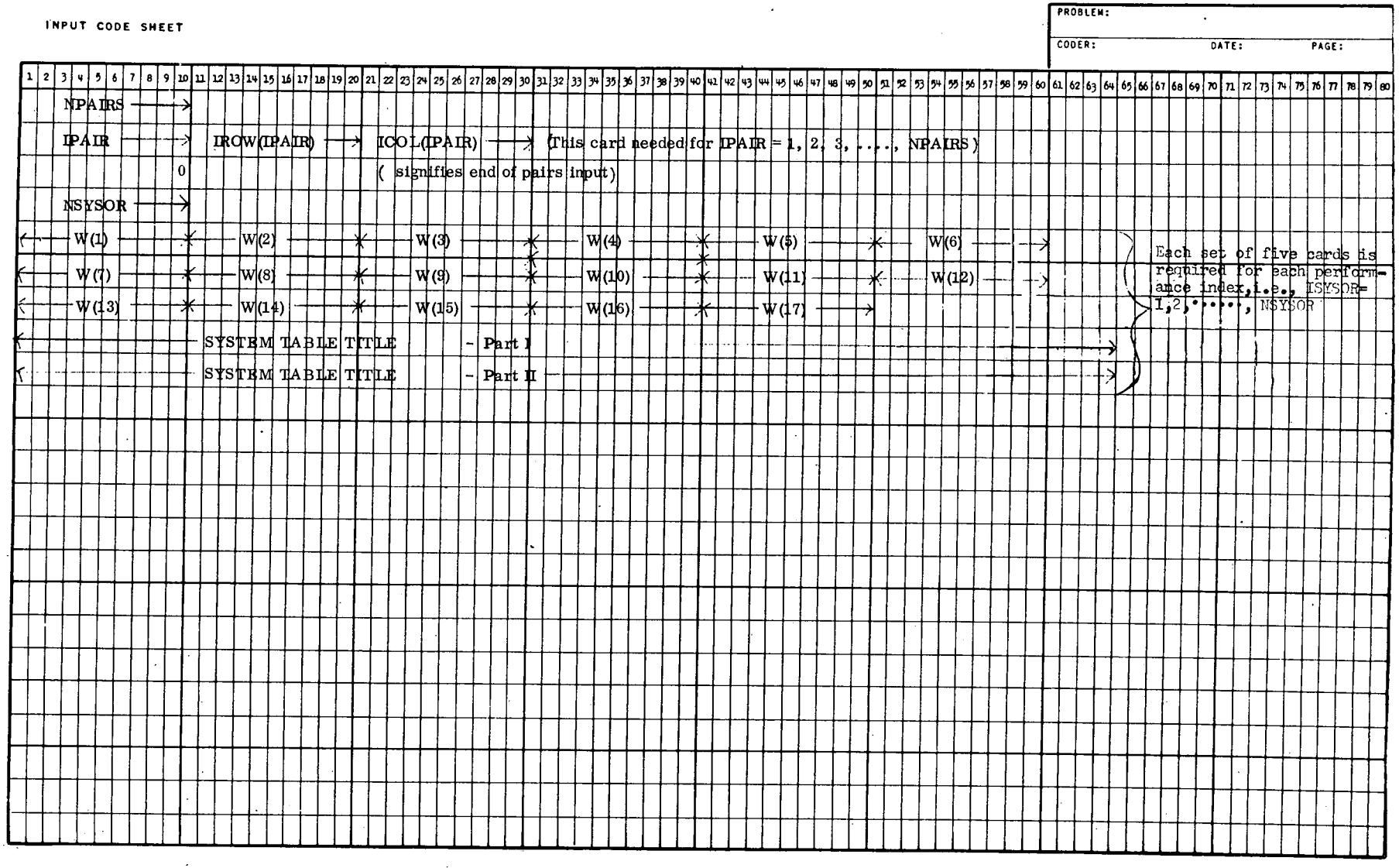


Figure II-2. Food System Evaluation Basic Model Input Format (concluded)

Where:

J	IDUM (J)
1	Reliability
2	Maintainability
3	Availability
4	Safety
5	Resupply Weight and Volume
6	Energy
7	Crew Requirements
8	Hot and Cold Water Requirements
9	Development Risk

h) NEQPS is the number of different pieces of equipment, which must be no greater than 200 and must be supplied for each mission.

i) IEQ cards give the equipment characteristics. Here:

(1) IEQ = equipment number

(2) All characteristics indicated are self-explanatory except that x. xx. xx. xx is equipment number, used in printing table of equipments and "EQPT. NAME" is name of equipment which is also used in printing table of equipments

(3) The units in which the equipment characteristics are inputted must correspond to the units for each characteristic as given in Section C, above.

(4) If equipment characteristics are identical in a given mission to the characteristics in the previous mission, the card can be omitted. Thus, for all missions after the first one, the IEQ cards inputted are only those which correspond to a change in one or more input characteristics.

j) N(I) = number of sub-functions in function I, which must be no greater than 10. If $N(I') = 0$, then all information in that card and succeeding cards up to "NPAIRS" is set as in the previous mission, and succeeding cards can be omitted for data relating to I'.

k) M(I, J) = number of equipment lists in sub-function J of function I. M(I, J) cannot be greater than 10.

l) IQ(I, J, K) = number of pieces of equipment in equipment list K in sub-function J of function I. This number cannot be greater than 10.

m) IC_{IJkl} = equipment number associated with equipment number 1 of equipment list K, sub-function J, function I. If IQ (I, J, K) = 0 for some I, J, K, the corresponding equipment values may be inputted as anything and are ignored.

n) NPAIRS = number of pairs of equipment which are not compatible; this number must be no greater than 50. This card is required for each mission.

o) IPAIR = Pair number IPAIR of the NPAIRS of the incompatible equipments. For repeated missions, these cards are identical to the IEQ cards, described in 1)(4) above. If a particular pair is compatible in a mission but was not in the previous mission, input appropriate IPAIR value with IROW (IPAIR) = 0 and ICOL (IPAIR) = 0.

p) IROW (IPAIR) = first equipment number in incompatible pair number. IPAIR.

q) ICOL (IPAIR) = second equipment number in incompatible pair number IPAIR.

r) NSYSOR = number of different performance indices to be considered in the case. This card and the following 5 cards must be supplied for each mission.

s) W(I) = weighting factor, used in performance index, to multiply characteristic I.

$$\text{Perf. Index} = \sum_{J=1}^{17} W(I) \times \text{Char}(I)$$

Where

I	CHAR (J)
1	Acceptance Measure
2	Weight
3	Volume
4	Power

I	CHAR (J)
5	Cost
6	Failure Rate
7	Reliability
8	Maintainability
9	Safety
10	Resupply Weight
11	Resupply Volume
12	Energy
13	Crew Requirements
14	Hot Water Requirements
15	Cold Water Requirements
16	Development Risk
17	Availability

The performance index is always minimized.

t) System table title (128 characters long) is printed at top of each page of table of food system characteristics for that performance index.

u) A card with a 0 in the 10th column is needed after the IEQ cards for each mission. Similarly, this card is needed for each mission after the pairs input.

b. Output

The basic model produces the following output:

1) General descriptive matter for the output tables.
2) A table of the candidate equipment characteristics. This table provides the following data for each candidate equipment:
   a) Study serial number
   b) Equipment name
   c) Equipment study number
   d) Function for which equipment is used
   e) Acceptance measure
   f) Weight
   g) Volume

h) Power
i) Cost
j) Failure rate
k) Operating time
l) Maintainability rate
m) Safety rate
n) Resupply weight
o) Resupply column
p) Energy
q) Crew requirements
r) Hot water requirements
s) Cold water requirements
t) Development risk

3) A table of the candidate functional subsystems. For each functional subsystem, the table supplies the following information:

a) The subsystem serial number
b) The subsystem composition, i.e., the list of equipments by serial numbers which compose the subsystem.
c) The values of subsystem characteristics, items 2) -d) through t) above, with the addition of reliability.

4) The list of incompatible equipments by serial numbers.

5) A table of optimal systems by performance index, for each performance index inputted. For each system, the following information is supplied:

a) The system serial number
b) The system composition, i.e., the list of subsystems by serial numbers which compose the system.
c) The values of system characteristics, items 2) - d) through t) above, with the addition of reliability and availability and the deletion of failure rate.

2. Evaluation Program Input and Output Description

a. Input

1) The basic minimum (or maximum) value of each of the system characteristics which is acceptable (constraint values). Thus; the following values are inputted:

   a) Lowest value of system crew acceptance
   b) Highest value of system weight
   c) Highest value of system volume
   d) Highest value of system power requirements
   e) Highest value of system cost
   f) Highest value of system failure rate
   g) Lowest value of system reliability
   h) Highest value of system maintainability rate
   i) Highest value of system safety
   j) Highest value of system resupply weight per resupply mission
   k) Highest value of system resupply volume per resupply mission
   l) Highest value of system energy requirements
   m) Highest value of system crew manhours requirements
   n) Highest value of system hot water requirements
   o) Highest value of system cold water requirements
   p) Highest value of system development risk
   q) Lowest value of system availability

2) The number of systems to be obtained for each performance index and constraint set.

3) The variations in the basic system characteristic constraints for which systems are to be obtained. The constraints of up to 5 system characteristics can be varied in a given run.

4) The IBM card formats for this data are given in Figure II-3. In this figure:

   a) NCASES = The number of different missions to be processed from tape generated by the basic model. Each mission consists of "NSYSOR" different performance index minimizations, where NSYSOR is transmitted from the basic model to the evaluation model but must be known when inputting to the evaluation model since the basic series of cards depicted on Figure II-3 must be provided for each performance index.

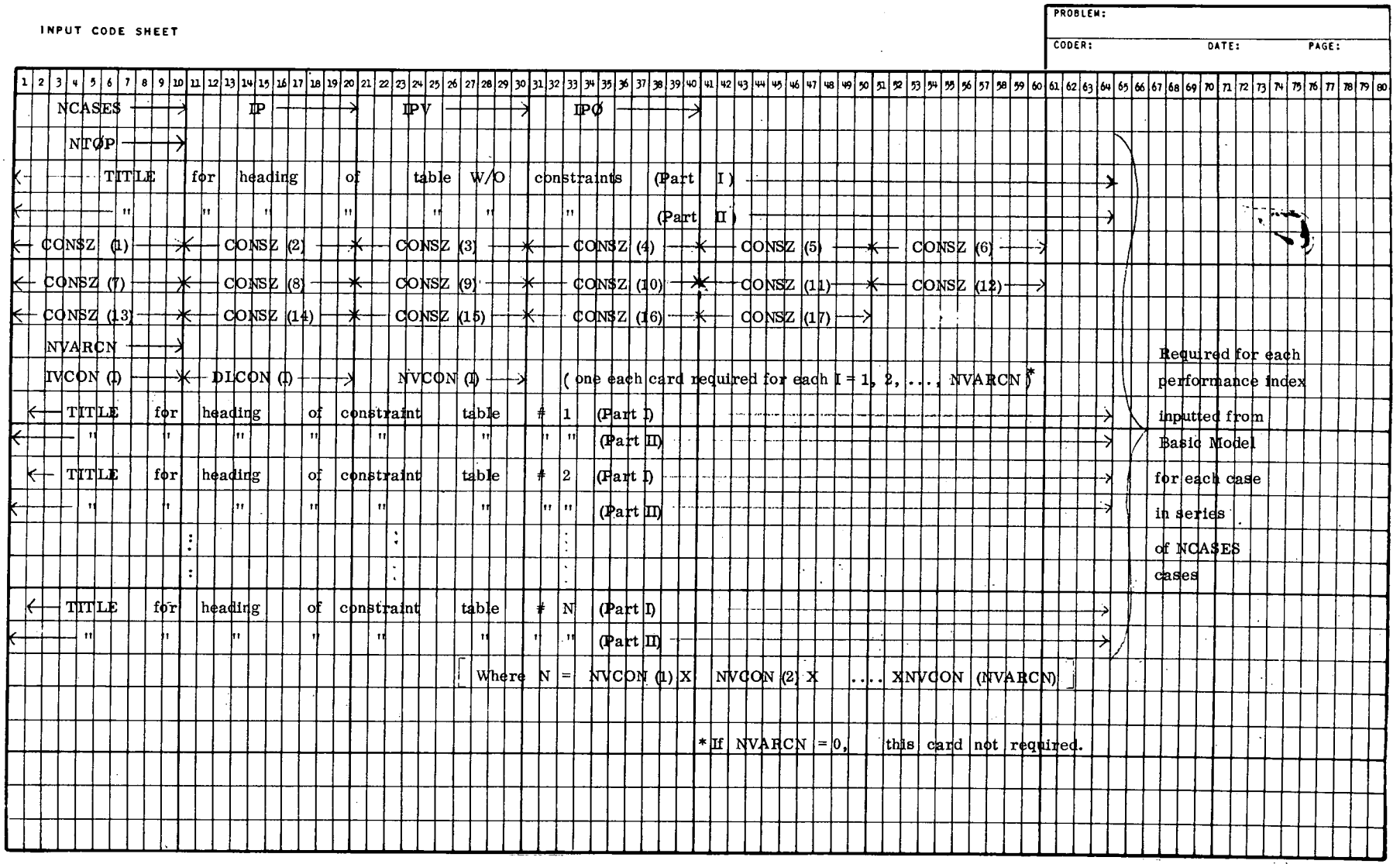


Figure II-3. Food System Evaluation, Evaluation Model Input Format

b) IP, IPV and IPO have no effect if all have zero value or left blank. If any or all are ∓ 0, intermediate print is triggered from different areas in program.

c) NTOP = The number of systems to be obtained in each table, both for the tables with and those without constraints. The top NTOP systems are listed, providing NTOP such systems are available, otherwise, the number of available systems is listed, which may be zero. "Top" here means the systems which minimize the performance index established in the basic model.

d) CONSZ(I) = base constraint value (for varying constraints) or fixed constraint value (for non-varying constraints) for characteristic # I, where:

I	CONSZ (I) is
1	lowest value for ACCEPTANCE measure
2	highest value for WEIGHT
3	highest value for VOLUME
4	highest value for POWER
5	highest value for COST
6	highest value for FAILURE RATE
7	lowest value for RELIABILITY
8	highest value for MAINTAINABILITY
9	highest value for SAFETY
10	highest value for RESUPPLY WEIGHT
11	highest value for RESUPPLY VOLUME
12	highest value for ENERGY
13	highest value for CREW REQUIREMENTS
14	highest value for HOT WATER REQUIREMENTS
15	highest value for COLD WATER REQUIREMENTS
16	highest value for DEVELOPMENT RISK
17	lowest value for AVAILABILITY

e) NVARCN = number of constraint parameters allowed to vary; NVARCN must be no greater than 5. (If NVARCN = 0, only the basic constraint values are used)

f) IVCON(I) = characteristic number of constraints to vary for variable constraint parameter number I where
IVCON(I) = 1 for ACCEPTANCE measure
IVCON(I) = 2 for WEIGHT
.
.
.
IVCON(I) = 17 for AVAILABILITY

g) DLCON(I) = increment used in varying constraint value for characteristic number IVCON(I).

h) NVCON(I) = total number of values allowed for constraint characteristic, number IVCON(I), which includes basic constraint case. Hence, in general, NVCON(I) is 2 or greater.

i) The constraint cases are run in the following order. The first case is the one corresponding to the basic constraints. The next case is the one with the basic constraints except for the constraint for the characteristic corresponding to the last IVCON that was inputted, which becomes the basic constraint plus DLCON. The next case considers the next increment on the last characteristic, etc., until NVCON cases are run. The process then repeats with the next constraint on the characteristic corresponding to the next to last IVCON inputted, going through the variations on the last IVCON again. This continues until $\prod_{I}$ NVCON(I) are run.

j) A two-part title must be provided (on two cards) for each case; the order must be the same as the order of cases as run (described above). If NVARCN = 0, only the first 2-part title is inputted.

b. Output

The evaluation model provides tables of systems and system characteristics for each performance index, as selected in the basic model, and for each of the constraint sets selected. The number of systems obtained in each table are equal to the amount inputted as described above, and the entries in each table are ordered by the

performance index with the optimal system appearing at the head of the table. For each system, the table gives the identical information as described above for the systems output of the basic model. Thus, for example, tables of the 10 minimum weight systems, 5 minimum cost systems, 15 systems with maximum availability as well as tables of the 10 minimum weight systems where systems' volume is less than 100 cubic feet, can be obtained.

3. Plot Program Input and Output Description

a. Input

1) The number of plots required for each performance index (from the basic program) and the ordinate and abscissa for each plot.

2) The IBM card formats for this data are given in Figure II-4. In this figure:

a) NCASES = number of cases to be processed from tape generated by basic model (each case treats several performance indices)

b) IP, IPP, IPPLOT - have no effect if all are set to zero or left blank; if one or more are not zero, then intermediate print is triggered from different areas of program.

c) Auxiliary Title No. I - 36 (or less) characters. Title inputted for printing in upper right hand corner of each plot for performance index #I, (I = 1, 2, .., NSYSOR).

d) $(NPLOTS)_I$ = Number of plots to be generated for performance index No. I, (I = 1,2, .., NSYSOR).

e) $(IABSC)_{IJ}$ = The characteristic number, (see g) below), for the abscissa of plot #J for performance index I (I = 1, 2, .., NSYSOR; J = 1, 2, .., $(NPLOTS)_I$)

f) $(IORD)_{IJ}$ = The characteristic number, (see g) below), for the ordinate of plot #J for performance index I (I = 1, 2, ..., NSYSOR; J = 1, 2, ..., $(NPLOTS)_I$)

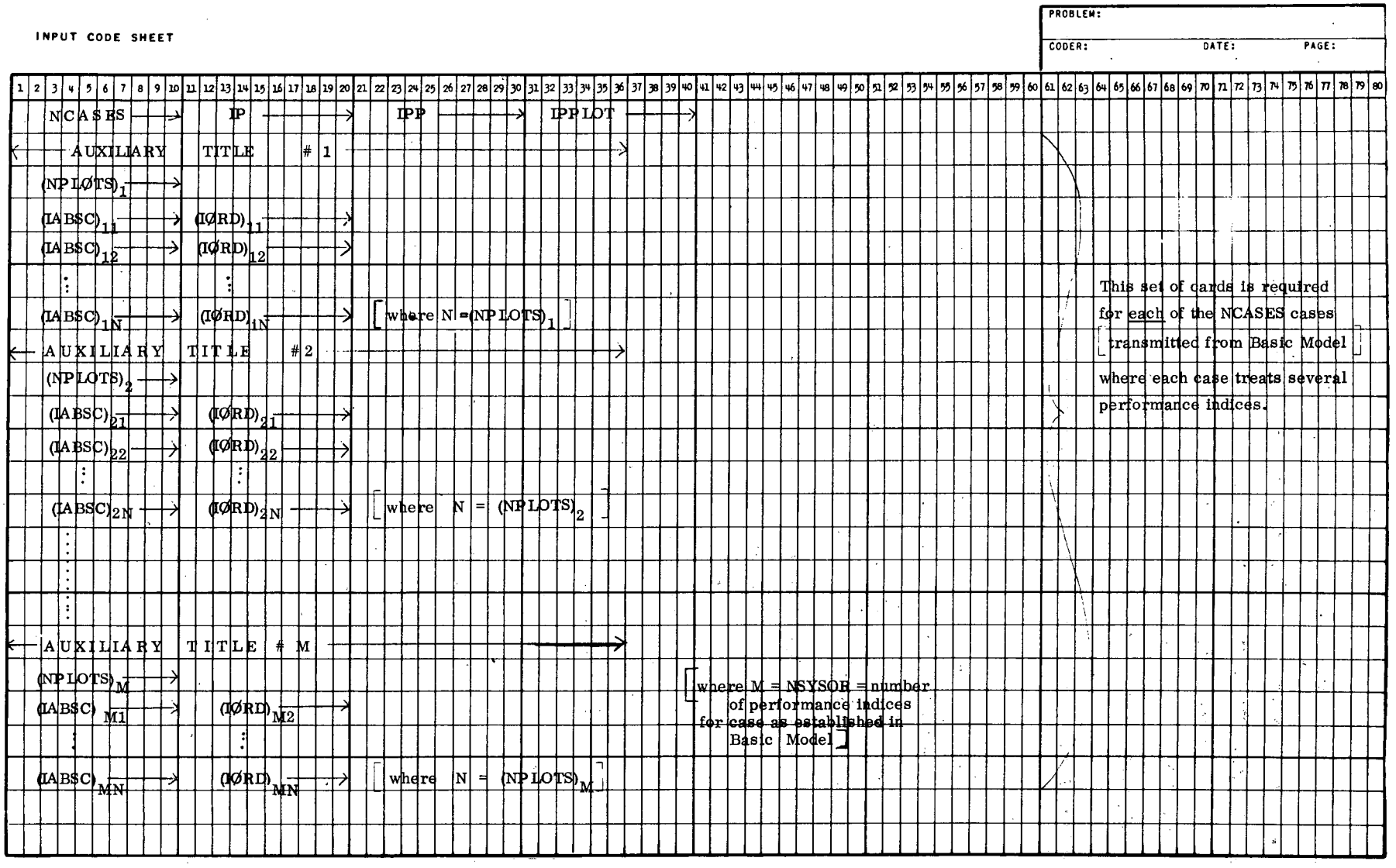


Figure II-4. Food System Evaluation, Plot Model Input Format

g) Characteristic numbers in plot which are defined by:

Character Number	Description
1	ACCEPTANCE measure
2	WEIGHT
3	VOLUME
4	POWER
5	COST
6	RELIABILITY
7	SAFETY
8	RESUPPLY WEIGHT
9	RESUPPLY VOLUME
10	ENERGY
11	CREW REQUIREMENTS
12	HOT WATER REQUIREMENTS
13	COLD WATER REQUIREMENTS
14	DEVELOPMENT RISK
15	AVAILABILITY

b. Output

The plot model provides a chart corresponding to each inputted plot. In addition, a listing is provided for each chart, indicating the abscissa value, the system number and the system composition in terms of its subsystems for each plotted point.

SECTION III

FOOD SYSTEMS ANALYSIS

A. SCOPE

The evaluation model, described above, was used to synthesize and analyze food systems for the equipments studied under this contract and for the following space missions:

TABLE III-1. MISSIONS DEFINITIONS

Mission #	Resupply (Days)	Crew Size	No. of Sittings	H_2O Balance	Wet Food Mix
1	14	6	1	20/80%	B
2	14	6	1	20/80%	C
3	14	6	1	60/40%	B
4	14	6	1	60/40%	C
5	14	6	1	85/15%	B
6	14	6	1	85/15%	C
7	14	12	1	20/80%	B
8	14	12	1	20/80%	C
9	14	12	1	60/40%	B
10	14	12	1	60/40%	C
11	14	12	1	85/15%	B
12	14	12	1	85/15%	C
25	90	6	1	20/80%	B
26	90	6	1	20/80%	C
27	90	6	1	60/40%	B
28	90	6	1	60/40%	C
29	90	6	1	85/15%	B
30	90	6	1	85/15%	C
31	90	12	1	20/80%	B
32	90	12	1	20/80%	C
33	90	12	1	60/40%	B
34	90	12	1	60/40%	C
35	90	12	1	85/15%	B
36	90	12	1	85/15%	C

For each mission, systems were synthesized for various performance indices and under various constraints. In addition, selected charts were made using the plotting model.

The concepts and equipment characteristics were obtained as described in Volume I of this report. The mission subfunctions and the equipment groups that could perform each subfunction for each mission are given in Table III-2. The remainder of the inputs are given with each model run in Section IV, (under separate cover).

B. GUIDE TO MODEL RUNS (Section IV)

Section IV contains the basic and evaluation model results for missions 1-12 and 25-36. For each mission, the following data is presented:

1. A table of the candidate equipments that could be used in the food systems for that mission, and the performance and requirement characteristics of each equipment.

2. A table of the candidate functional subsystems, with their characteristics and composition.

3. An ordered table of the top 20 optimal food systems system characteristics, optimized as the minimum of the sum of weight, volume, resupply weight and resupply volume, with no constraints. The table number on this table (and on the following ones) follows the format x - y - z where:

   x = mission number

   y = abbreviation for the optimizing performance index

   z = constraints indicator

   Thus, these tables are M-WVRR-1.

4. Tables M-WVRR-1 through M-WVRR-8 where each table gives the ordered top 20 optimal food systems and the system characteristics, optimized as the minimum of the sum of weight, volume, resupply weight and resupply volume with constraints as follows:

TABLE III-2. SUBFUNCTIONS AND EQUIPMENT LISTS

FUNCTION No.	FUNCTION Name	SUBFUNCTION No.	SUBFUNCTION Name	MISSIONS	EQUIPMENT LISTS List No.	EQUIPMENT LISTS
1.0	Food	1.1	Food Types	All	1.1.1	Food Mix
2.0	Storage	2.1	Frozen Storage	All	2.1.1	Space Radiation Freezer
					2.1.2	Thermal Freezer
					2.1.3	Turbo/Compressor Freezer
		2.2	Refrigerated Storage	All	2.2.1	Water Sublimation Refrigerator
					2.2.2	Space Radiation Refrigerator
					2.2.3	Thermal Refrigerator
					2.2.4	Turbo/Compressor Refrigerator
		2.3	Stable Storage	All	2.3.1	Ambient Storage, Rigid
					2.3.2	Ambient Storage, Flexible
3.0	Preparation	3.1	Food Heating and Warming	All	3.1.1	Hot Air Oven
					3.1.2	Self Heating Pack
					3.1.3	Microwave Radiation Oven
					3.1.4	Hot Air Radiation Oven
					3.1.5	Heated Food Tray
		3.2	Powered Preparation	All	3.2.1	Food Warming Plate, Reconstitution Machine, Cold Display Cabinet
		3.3	Preparation Counters	All	3.3.1	Preparation Counter
					3.3.2	Powered Counter
					3.3.3	Fold-Away Counter
					3.3.4	Preparation and Serving Counter
		3.4	Snack Dispensers	All	3.4.1	Snack Bar
		3.5	Storage and Dispensing Cabinets	All	3.5.1	Food Dispensing Cabinet
					3.5.2	Food Storage Cabinet
					3.5.3	Self Storage Cabinet
					3.5.4	Automatic Storage Cabinet
		3.6	Preparation Utensils	1-6, 25-30	3.6.1	Hand Kneeding, Hot Food Tongs, Clam Shell Device, Scoop, Utility Shears, Spatula, Food Chopper
					3.6.2	Hot Food Tongs, Clam Shell Device, Scoop, Utility Shears, Hand Mixer/Blender, Spatula, Food Chopper

TABLE III-2. SUBFUNCTIONS AND EQUIPMENT LISTS (Cont'd)

FUNCTION No.	FUNCTION Name	SUBFUNCTION No.	SUBFUNCTION Name	MISSIONS	List No.	EQUIPMENT LISTS
				7-12, 31-36	3.6.1	Mechanical Kneeder, Hot Food Tongs, Clam Shell Device, Scoop, Utility Shears, Hand Mixer/Blender, Spatula, Food Chopper
		3.7	Debris Entrainment	All	3.7.1	Controlled Spillage Module
		3.8	Restraints	All	3.8.1	Waist Restraint
		3.9	Food Transport	1-6, 25-30	3.9.1	Mechanical Rail Transport, Net-Type Bag, Food Handling Tongs
				7-12,31-36	3.9.1	Mechanical Rail Transport, Dolly Guide Cart, Net-Type Bag, Food Handling Tongs, Food Transport Conveyor
					3.9.2	Mechanical Rail Transport, Dolly Guide Cart, Net-Type Bay, Food Handling Tongs, Magnetic Conveyor
4.0	Serving	4.1	Serving and Storage	All	4.1.1	Self Service, Tray/Rail Conveyor, Storage Rack
					4.1.2	Self Service, None (eat in galley), Storage Rack
					4.1.3	Steward Service, Tray/Rail Conveyor, Storage Rack
					4.1.4	Steward Service, Tray Rack/Rail Conveyor
5.0	Consumption	5.1	Food Restraint	All	5.1.1	Recessed Tray, Cohesive Food, Positive Displacement Drinking Device
					5.1.2	Spiked Ribbed Tray, Cohesive Food, Positive Displacement Drinking Device
					5.1.3	Recessed Tray, Bite Sized Food, Positive Displacement Drinking Device
					5.1.4	Spiked Ribbed Tray, Bite Sized Food, Positive Displacement Drinking Device
					5.1.5	Covered Tray, Positive Displacement Drinking Device
					5.1.6	Covered Tray, Drinking Cup
				1-6	5.1.7	Package Containment, In-Package Liquid Restraint
				7-12, 25-36	5.1.7	Spiked Ribbed Tray, Bite Sized Food, In-Package Liquid Restraint.

TABLE II-2. SUBFUNCTIONS AND EQUIPMENT LISTS (Cont'd)

FUNCTION No.	FUNCTION Name	SUBFUNCTION No.	SUBFUNCTION Name	MISSIONS	List No.	EQUIPMENT LISTS
		5.2	Dining Utensils and Equipment Restraint	All	5.2.1	Knife, Spoon, Fork
					5.2.2	Disposable Knife, Disposable Spoon, Disposable Fork
					5.2.3	Magnetic Knife, Magnetic Spoon, Magnetic Fork
					5.2.4	Combination Spoon/Fork, Combination Knife/Fork/Tong
					5.2.5	Disposable Spoon/Fork, Disposable Knife/Fork/Tong
					5.2.6	Magnetic Spoon/Fork, Magnetic Knife/Fork/Tong
		5.3	Personnel Restraint	All	5.3.1	Stomach Support Restraint
					5.3.2	Lap Restraint
6.0	Clean-Up	6.1	Galley and Dining Area Cleaning	All	6.1.1	Hand Vacuum, Guided Vacuum, Disposable Wipes, Astrovac
					6.1.2	Hand Vacuum, Guided Vacuum, Reusable Wipes, Astrovac
		6.2	Wipes Management	All	6.2.1	Disposable Wipes Dispenser, Impregnated Wipes Dispenser, Receptacle-Temporary Wipes, Temporary Reusable Wipes Storage, Disposable Utility Wipes Dispenser
					6.2.2	Reusable Wipes Dispenser, Impregnated Wipes Dispenser, Receptacle-Temporary Wipes, Temporary Reusable Wipes Storage, Reusable Utility Wipes Dispenser
		6.3	Tray Management	All	6.3.1	Tray Return-Hand Carriage
					6.3.2	Tray Return-Rail System
					6.3.3	Tray Return Carrier
		6.4	Debris Management	All	6.4.1	Temporary Debris Storage, Debris-Hand Transport
					6.4.2	Temproray Debris Storage, Debris-Push Transport
		6.5	Utensil Cleanup	All	6.5.1	Galley Sink, Automatic Dishwasher-Dryer
		6.6	Stowage	All	6.6.1	Stowage of Equipment
7.0	Inventory	7.1	Inventory	All	7.1.1	Inventory System*

* Not Studied - Artifical for Model

TABLE III-3

Table	Constraints							
	Crew Accept.	Weight (Lbs)	Volume (Cu Ft)	Power (Watts)	Cost (K Dol.)	Resupply Weight (Lbs.)	Resupply Volume (Cu Ft)	Crew Req. (MH/D)
1-6-WVRR-1	6	650	100	35000	11000	500	30	35
1-6-WVRR-2	6	650	100	35000	11000	500	30	50
1-6-WVRR-3	6	650	150	35000	11000	500	30	35
1-6-WVRR-4	6	650	150	35000	11000	500	30	50
1-6-WVRR-5	6	750	100	35000	11000	500	30	35
1-6-WVRR-6	6	750	100	35000	11000	500	30	50
1-6-WVRR-7	6	750	150	35000	11000	500	30	35
1-6-WVRR-8	6	750	150	35000	11000	500	30	50
7-12-WVRR-1	6	850	150	40000	11500	850	45	45
7-12-WVRR-2	6	850	150	40000	11500	850	45	50
7-12-WVRR-3	6	850	200	40000	11500	850	45	45
7-12-WVRR-4	6	850	200	40000	11500	850	45	50
7-12-WVRR-5	6	900	150	40000	11500	850	45	45
7-12-WVRR-6	6	900	150	40000	11500	850	45	50
7-12-WVRR-7	6	900	200	40000	11500	850	45	45
7-12-WVRR-8	6	900	200	40000	11500	850	45	50
25-30-WVRR-1	6	650	100	35000	11000	3000	135	35
25-30-WVRR-2	6	650	100	35000	11000	3000	135	50
25-30-WVRR-3	6	650	200	35000	11000	3000	135	35
25-30-WVRR-4	6	650	200	35000	11000	3000	135	50
25-30-WVRR-5	6	850	100	35000	11000	3000	135	35
25-30-WVRR-6	6	850	100	35000	11000	3000	135	50
25-30-WVRR-7	6	850	200	35000	11000	3000	135	35
25-30-WVRR-8	6	850	200	35000	11000	3000	135	50
31-36-WVRR-1	6	1150	150	40000	11500	6000	300	45
31-36-WVRR-2	6	1150	150	40000	11500	6000	300	60
31-36-WVRR-3	6	1150	250	40000	11500	6000	300	45
31-36-WVRR-4	6	1150	250	40000	11500	6000	300	60
31-36-WVRR-5	6	1250	150	40000	11500	6000	300	45
31-36-WVRR-6	6	1250	150	40000	11500	6000	300	60
31-36-WVRR-7	6	1250	250	40000	11500	6000	300	45
31-36-WVRR-8	6	1250	250	40000	11500	6000	300	60

5. Tables M-WV-0, where each table gives the ordered top 20 optimal food systems and the systems characteristics, optimized as the minimum of the sum of weight and volume, with no constraints.

6. Tables M-WV-1, where each table gives the ordered top 20 optimal food systems and the system characteristics, optimized as the minimum of the sum of weight and volume with constraints identical to M-WVRR-1 (above in Table II-3).

7. Table M-W-0, where each table gives the ordered top 20 optimal food systems and the system characteristics, optimized for minimum weight with no constraints.

8. Tables M-W-1, where each table gives the ordered top 20 food systems and the system characteristics optimized for minimum weight with constraints identical to M-WVRR-1 (above in Table II-3).

9. Tables M-C-0, where each table gives the ordered top 20 food systems and the system characteristics optimized for minimum cost with no constraints.

10. Tables M-C-1, where each table gives the ordered top 20 food systems and the system characteristics optimized for minimum cost with constraints identical to M-WVRR-1, (above in Table II-3).

11. Tables M-V-0, where each table gives the ordered top 20 food systems and the system characteristics optimized for minimum volume with no constraints.

12. Tables M-V-1, where each table gives the ordered top 20 food systems and the system characteristics optimized for minimum volume with constraints identical to M-WVRR-1 (above in Table II-3).

In all of the model runs, it was assumed that the following pairs of equipments were incompatible; i. e., it would not be feasibile and/or desirable to have any one or more of these pairs in a food systems. These pairs are:

1. Tray/Rail Conveyor -Tray Return, Hand Carriage
2. Tray Rack/Rail Conveyor -Tray Return, Hand Carriage
3. Storage Rack -Tray Return Rail System
4. Tray Rack/Rail Conveyor - Tray Return Rail System
5. Tray/Rail Conveyor - Tray Return Carrier
6. Storage Rack - Tray Return Carrier

SECTION IV

Food Systems Data

Section IV, which consists of the food system model run results, is supplied under separate binding.

SECTION V
SYSTEMS ASSESSMENTS

A. SUMMARIES

The results of the system synthesis study, as given in the IBM runs of Section IV, are summarized in Tables V-1-1 through V-1-24 and Tables V-2-1 through V-2-17.

Tables V-1-M give the optimal 5 systems for each mission for the performance index, min (weight plus volume plus resupply weight plus resupply volume), both for no constraints and for a basic set of constraints, as noted on the tables. The particular equipment which compose each system are noted as well as the model system serial number.

Tables V-2-X give the optimal system by subsystems for each mission for the various performance indices and constraint sets. For each system, a selected set of system characteristics are given.

The following conclusions are derived from these summary tables and from the complete data:

1. For each mission, the most sensitive system characteristics are crew acceptance, crew requirements, resupply weight, and resupply volume, weight and volume. The least sensitive characteristics are reliability, safety, water requirements and availability. Because of the very high values of availability that were achieved with all systems, the measure is virtually meaningless.

2. For each mission, the performance index, min (weight and volume and resupply weight and resupply volume) appears to be superior than any of the others studied. The characteristics of the optimal systems synthesized with this index are as good or better, in general, than those obtained with any other index. Thus, for example, the costs of the optimal systems obtained with this index are almost as low as the costs of the minimal cost systems obtained with the minimum cost index.

3. For each mission, a method of selecting a system is to determine a meaningful set of constraints and to choose the optimal system based on these constraints and on a performance index. Thus, if the set of

basic constraints and the min (weight and volume and resupply weight and resupply volume) performance index are assumed, the systems to be selected for each mission are given in Tables V-1-1 through V-1-24 in column 1 under "Basic constraints."

4. There are close similarities in the group of missions 1-6, in the group of missions, 7-12, in the group of missions 25-30, and in the group of missions 31-36. In each group, only the diet water balance and food mix vary and the net result is that the optimal system is identical within each group. (It is noted that the subsystem serial numbers are newly established for each run of the evaluation model and that a given subsystem number on one mission does not necessarily correspond to the same subsystem as on another mission. Thus, in Tables V-2-1 through V-2-17, the repetition of subsystem numbers across missions does not necessarily indicate identical subsystems. However, because of the manner in which the model was inputted, there is numerical subsystems correspondence within mission groups, as above. These same comments are true for the system numbers on Tables V-1-M).

5. The optimal system composition differences among the various missions considered are relatively minor. They are summarized below, for the optimal system based on the index of min (weight and volume and resupply by weight and resupply volume) with no constraints.

Function	Missions 1-6	Missions 7-12	Missions 25-30	Missions 31-36
Preparation	Hand kneading Net type bag Fd. handling trays	Kneader, mechanical Mixer-blender Food transport conveyor Dolly guided cart	Hand kneading Net type bag Food handling trays	Kneader, mechanical Mixer-blender Food transport conveyor Dolly guided cart
Consumption	Package containment	Tray/spiked/ ribbed Bite sized food	Tray/spiked/ ribbed Bite sized food	Tray/spiked/ ribbed Bite sized food
Clean-up	Dispenser-utility wipes, disposable	Dispenser-utility wipes, disposable	Dispenser-utility wipes, reusable	Dispenser, utility wipes, reuseable

6. The characteristics of the optimal systems among the various missions considered varied considerably for the characteristics of weight, volume, cost, resupply weight, resupply volume and crew requirements. For the performance index, min (weight and volume and resupply weight and resupply volume), the variations were as follows:

Characteristic	Mission 1	7	25	31
Weight (lbs.)	595.4	819.3	656.1	1244
Volume (cu. ft.)	95.7	140.1	162.5	238.6
Cost (thousand dollars)	10431	11331	10457	11336
Resupply Weight (lbs.)	416.1	797.0	2622.9	5035.4
Resupply Volume (cu. ft.)	20.35	39.32	125.94	243.36
Crew Requirements (Manhr/day)	46	59.3	49.3	59.3

It is apparent that increasing the crew size and the resupply period has a significant effect on these characteristics, with crew size being the more critical one.

B. TRADE-OFF CHARTS

The evaluation model automatic plotting routine was used to produce charts of crew acceptance versus weight and crew acceptance versus volume for each mission for the performance index, min (weight and volume and resupply weight and resupply volume). These charts are presented in Figure V-1 through V-48.

Each point of these charts represents a food system as indicated on the chart and on the corresponding system composition table. The numbers on the system composition table represent the functional subsystems as defined in Section IV for each particular mission.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-1

MISSION - 001

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	99	13	61	19	67	109	201	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid					x					x										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F, Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs, Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-1 (Cont'd)

MISSION - 001

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender		x					x		x				x	x				x	x	
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x	x						x	x	x	x	x					
4.1.2.	56	Steward Service						x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x	x						x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.						x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x	x						x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food																				
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb. Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-1 (Cont'd) MISSION - 001

STUDY NO.	EQUIPMENT SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x	x						x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier						x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-1 (Cont'd) MISSION - 001

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-2

MISSION - 002

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	13	61	19	67	109	201	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x							x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid										x										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F. , Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs, Resupply Volume ≤ 30 C.F., Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-2 (cont'd)

MISSION - 002

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender							x		x				x	x				x	x	
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food																				
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤ 30 C. F, Crew Req. ≤35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-2 (cont'd) MISSION - 002

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-2 (cont'd) MISSION - 002

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs., Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤ 30 C. F., Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-3

MISSION - 003

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	13	61	19	67	109	201	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x							x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid										x										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs Resupply Volume ≤ 30 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-3 (Cont'd.) MISSION - 003

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender										
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.										
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor										
3.11.2.	45	Mag. Conveyor										
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart										
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x						
4.1.2.	56	Steward Service					x	x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor										
4.1.6.	58	None (eat in galley)	x	x	x	x						
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x						
5.4.1.	65	Tray/Recesses										
5.4.3.	66	Tray/spiked, ribbed										
5.4.4.	67	Cohesive Food										
5.4.5.	68	Bite sized Food										
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray										
5.4.11.	71	Edible Coating										
5.5.2.	72	Pos. Dis. Drink										
5.5.2.	73	Drinking Cup										
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender										
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.										
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor										
3.11.2.	45	Mag. Conveyor										
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart										
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x	x					
4.1.2.	56	Steward Service						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor										
4.1.6.	58	None (eat in galley)	x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x	x					
5.4.1.	65	Tray/Recesses										
5.4.3.	66	Tray/spiked, ribbed										
5.4.4.	67	Cohesive Food										
5.4.5.	68	Bite sized Food										
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray										
5.4.11.	71	Edible Coating										
5.5.2.	72	Pos. Dis. Drink										
5.5.2.	73	Drinking Cup										
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x

*** Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤35000 Watts, Cost ≤$11 million, Resupply Wt ≤500 lbs Resupply Volume ≤30 C.F., Crew Req. ≤ 35 manhours/day.**

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-3 (Cont'd) MISSION - 003

STUDY NO.	EQUIPMENT SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.					x	x	x	x	x	x						x	x	x	x	x
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤650 lbs., Volume ≤100C. F., Power ≤35000 Watts, Cost ≤$11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤30 C. F., Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-3 (Cont'd) MISSION - 003

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ , Volume ≤ , Power ≤ Watts, Cost ≤ , Resupply Wt ≤ Resupply Volume ≤ , Crew Req. ≤ manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-4

MISSION - 004

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	13	61	19	67	109	29	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x							x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid										x										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs, Resupply Volume ≤ 30 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-4 (cont'd)

MISSION - 004

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender							x		x				x	x				x	x	
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food																				
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500lbs Resupply Volume ≤ 30 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-4 (cont'd) MISSION - 004

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤650 lbs, Volume ≤100 C.F., Power ≤ 35000 Watts, Cost ≤$11 million., Resupply Wt ≤500lbs Resupply Volume ≤ 30C.F., Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 4 (cont'd) MISSION - 004

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lb., Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lb Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 5 MISSION - 005

EQUIPMENT STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	13	61	19	67	109	29	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x							x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp										x										
2.3.1.	11	Amb. Stor, - Rigid	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
2.3.2.	12	Amb. Stor, - Flex.																				
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ .100 C.F, Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs Resupply Volume ≤ 30 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 005 (Cont'd)

MISSION - 005

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender							x		x					x	x				x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food																				
5.4.6.	69	Package Contain.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500lbs Resupply Volume ≤ 30 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 5 (Cont'd) MISSION - 005

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤35000 Watts, Cost ≤$11 million., Resupply Wt ≤ 500lbs Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 5 (Cont'd) MISSION - 005

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤650 lbs, Volume ≤100 C.F., Power ≤35000 Watts, Cost ≤$11 million, Resupply Wt ≤500 lbs Resupply Volume ≤ 30 C.F, Crew Req. ≤35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-6

MISSION - 006

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	13	61	19	67	109	201	195	273	267	207	217	211	239	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x							x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid										x										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 , Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million , Resupply Wt ≤ 500 lb
Resupply Volume ≤ 30 C. F., Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-6 (cont'd)

MISSION - 006

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender							x		x				x	x				x	x	
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food																				
5.4.6.	69	Package Contain.	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*** Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 , Volume ≤ 100 C. F., Power ≤35000 Watts, Cost ≤$11 million., Resupply Wt ≤500 lbs Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.**

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-6 (cont'd) MISSION - 006

STUDY NO.	SERIAL NO.	NAME	EQUIPMENT INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤35000 Watts, Cost ≤$11 million, Resupply Wt ≤500 lbs Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-6 (cont'd) MISSION - 006

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 , Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 500 lbs Resupply Volume ≤ 30 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-7

MISSION - 007

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	133	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid									x											
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs., Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 850 lbs. Resupply Volume ≤ 45 C.F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-7 cont.

MISSION -007

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
			NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x	x	x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x					x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤850 lbs, Volume ≤150 C.F., Power ≤40000 Watts, Cost ≤11.5 million, Resupply Wt ≤850 lbs Resupply Volume ≤45 C.F, Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-7 cont. MISSION - 007

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS 1	2	3	4	5	BASIC* CONSTRAINTS 1	2	3	4	5	INDEX = MIN (WT + VOL) NO CONSTRAINTS 1	2	3	4	5	BASIC * CONSTRAINTS 1	2	3	4	5
5.6.2.	75	Knife																					
5.6.2.	76	Spoon																					
5.6.2.	77	Fork																					
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x											x
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x											x
5.6.4.	80	Knife, Disposable											x		x		x	x		x			
5.6.4.	81	Fork, Disposable											x		x		x	x		x			
5.6.4.	82	Spoon, Disposable											x		x		x	x		x			
5.6.5.	83	Spork, Disposable												x		x			x		x		
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x		
5.8.1.	85	Magnetic Knife																					
5.8.1.	86	Spoon, Magnetic																					
5.8.1.	87	Fork, Magnetic																					
5.8.1.	88	Spork, Magnetic			x	x				x	x												
5.8.1.	89	Comb k/f/t. Mag.			x	x				x	x												
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																					
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x						
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																					
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x						
6.2.9.	111	Tray Ret Rail Sys.																					
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																					

* Basic Constraints = CR. ACC ≥ 6, WT ≤850 lbs , Volume ≤150 C.F., Power ≤40000 Watts, Cost ≤11.5 million, Resupply Wt ≤850 lbs Resupply Volume ≤45 C.F., Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-7 cont. MISSION - 007

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤850 lbs., Volume ≤150 C.F., Power ≤40000 Watts, Cost ≤11.5 million, Resupply Wt ≤850 lbs Resupply Volume ≤45 C.F., Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-8

MISSION - 008

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	85	237	231	201	195	240	259	223	331	295	403
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				x
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.										x								x	x	
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x			x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-8 (continued)

MISSION - 008

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x		x	x	x		x		x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x				x		x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤40000 Watts, Cost ≤$11.5 million, Resupply Wt ≤850 lbs Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-8 (continued) MISSION - 008

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x						x	x	x	x	x
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x						x	x	x	x	x
5.6.4.	80	Knife, Disposable											x		x		x					
5.6.4.	81	Fork, Disposable											x		x		x					
5.6.4.	82	Spoon, Disposable											x		x		x					
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x				x	x											
5.8.1.	89	Comb k/f/t. Mag.			x	x				x	x											
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs., Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11,5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 8 (continued) MISSION - 008

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-9

MISSION - 009

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	85	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.										x										
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 850 lb. Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-9 (Cont'd)

MISSION - 009

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x		x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x					x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*** Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 mil., Resupply Wt ≤ 850 lb, Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.**

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-9 (Cont'd) MISSION - 009

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x										
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x										
5.6.4.	80	Knife, Disposable											x		x		x	x		x		
5.6.4.	81	Fork, Disposable											x		x		x	x		x		
5.6.4.	82	Spoon, Disposable											x		x		x	x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x				x	x											
5.8.1.	89	Comb k/f/t. Mag.			x	x				x	x											
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 mill., Resupply Wt ≤ 850 lb. Resupply Volume ≤ 45 C. F. Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-9 (Cont'd) MISSION - 009

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lb., Volume ≤ 150 C. F, Power ≤ 40000 Watts, Cost ≤ $11.5million Resupply Wt ≤ 850 lb Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-10

MISSION - 010

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	35	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F. , Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 850lbs. Resupply Volume ≤ 45C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-10 (cont'd)

MISSION - 010

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x		x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x					x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*** Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 850 Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45manhours/day.**

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-10 (cont'd) MISSION - 010

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x										
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x										
5.6.4.	80	Knife, Disposable											x		x		x	x		x		
5.6.4.	81	Fork, Disposable											x		x		x	x		x		
5.6.4.	82	Spoon, Disposable											x		x		x	x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x				x	x											
5.8.1.	89	Comb k/f/t, Mag.			x	x				x	x											
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 850lbs Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-10 (cont'd) MISSION - 010

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤40000 Watts, Cost ≤$11.5 million Resupply Wt ≤850lbs Resupply Volume ≤ 45 C.,FCrew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-11

MISSION - 011

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	85	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.										x										
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 850 lbs. Resupply Volume ≤ 45 C. F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 11 (cont'd)

MISSION - 011

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x		x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x					x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤850 lbs., Volume ≤ 150 C. F., Power ≤40000 Watts, Cost ≤$11.5 million Resupply Wt ≤850 lbs Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 11 (cont'd) MISSION - 011

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x										x
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x										x
5.6.4.	80	Knife, Disposable											x		x		x	x		x		
5.6.4.	81	Fork, Disposable											x		x		x	x		x		
5.6.4.	82	Spoon, Disposable											x		x		x	x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x				x	x											
5.8.1.	89	Comb k/f/t. Mag.			x	x				x	x											
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤850 lbs., Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤$11.5 million Resupply Wt ≤850 Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-11 (cont'd) MISSION - 011

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 850 Resupply Volume ≤ 45 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 12

MISSION - 012

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	37	13	43	19	85	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.										x										
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C.F., Power ≤4000 Watts, Cost ≤11.5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C.F, Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 12 (Cont'd)

MISSION - 012

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x		x	x	x	x	x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x					x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C.F., Power ≤ 4000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C.F; Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 12 (Cont'd) MISSION - 012

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x	x	x	x	x	x	x	x	x										x
5.6.3.	79	Comb. Knife/Fk/tong	x	x	x	x	x	x	x	x	x	x										x
5.6.4.	80	Knife, Disposable											x		x		x	x		x		
5.6.4.	81	Fork, Disposable											x		x		x	x		x		
5.6.4.	82	Spoon, Disposable											x		x		x	x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x			x	x												
5.8.1.	89	Comb k/f/t. Mag.			x	x			x	x												
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C.F., Power ≤ 4000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 850 lbs Resupply Volume ≤ 45 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-12 (Cont'd) MISSION - 012

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.																				
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 850 lbs, Volume ≤ 150 C.F., Power ≤ 4000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 850lbs Resupply Volume ≤ 45 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-13

MISSION - 025

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13		N	O	N	E	201	195	273	267	207					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer																	N	O	N	E
2.1.7.	5	Thermoel Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid	x	x	x	x	x						x	x	x	x	x					
2.3.2.	12	Amb. Stor, - Flex.																				
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x						x	x			x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 2000 lb Resupply Volume ≤ 135 C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-13 (Cont'd.) MISSION - 025

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender		x		x									x	x						
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x		x					
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x						x	x	x		x					
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x						x	x	x		x					
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses	x	x	x	x	x						x	x	x	x	x					
5.4.3.	66	Tray/spiked, ribbed																				
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* **Basic Constraints** = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb. Resupply Volume ≤ 135 C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-13 (Cont'd.) MISSION - 025

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x																
5.6.2.	76	Spoon			x	x																
5.6.2.	77	Fork			x	x																
5.6.3.	78	Comb. Spoon/Fork	x	x			x										x					
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x										x					
5.6.4.	80	Knife, Disposable											x		x							
5.6.4.	81	Fork, Disposable											x		x							
5.6.4.	82	Spoon, Disposable											x		x							
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x	x					
6.1.8.	104	Reuscable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.											x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.	x	x	x	x	x															
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb Resupply Volume ≤ 135 C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-13 (Cont'd.) MISSION -025

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤$11 million, Resupply Wt ≤3000lb Resupply Volume ≤135 C. F, Crew Req. ≤ 35manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-14

MISSION - 026

STUDY NO.	EQUIPMENT SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13						201	195	273	267	207					
1.1.1	1	Food Mix	X	X	X	X	X						X	X	X	X	X					
2.1.6.	4	Spc Rad. Freezer																				
2.1.7.	5	Thermoel Freezer	X	X	X	X	X						X	X	X	X	X					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	X	X	X	X	X						X	X	X	X	X					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	X	X	X	X	X						X	X	X	X	X					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	X	X	X	X	X						X	X	X	X	X					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	X	X	X	X	X						X	X	X	X	X					
3.3.2.	21	Reconstitution Mach.	X	X	X	X	X						X	X	X	X	X					
3.3.3.	22	Cold Display Cab.	X	X	X	X	X						X	X	X	X	X					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	X	X	X	X	X						X	X	X	X	X					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	X	X	X	X	X						X	X	X	X	X					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	X	X	X	X	X						X	X	X	X	X					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	X		X		X						X	X			X					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb. Resupply Volume ≤ 135 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-14 (cont.)

MISSION - 026

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	X	X	X	X	X						X	X	X	X	X					
3.8.4.	36	Clam Shell Device	X	X	X	X	X						X	X	X	X	X					
3.8.7.	37	Scoop	X	X	X	X	X						X	X	X	X	X					
3.8.9.	38	Utility Shears	X	X	X	X	X						X	X	X	X	X					
3.8.10.	39	Hand Mixer-Blender		X		X									X	X						
3.8.11.	40	Spatula	X	X	X	X	X						X	X	X	X	X					
3.8.12.	41	Food Chopper	X	X	X	X	X						X	X	X	X	X					
3.9.1.	42	Cont. Spill. Mod.	X	X	X	X	X						X	X	X	X	X					
3.10.3.	43	Waist Restraint	X	X	X	X	X						X	X	X	X	X					
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	X	X	X	X	X						X	X	X		X					
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	X	X	X	X	X						X	X	X		X					
3.11.7.	49	Fd. Handling Tongs	X	X	X	X	X						X	X	X		X					
4.1.1.	55	Self Service	X	X	X	X							X	X	X	X	X					
4.1.2.	56	Steward Service					X															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	X	X	X	X							X	X	X	X	X					
4.1.7.	59	Tray Rack/Rail Con.					X															
4.2.1.	60	Storage Rack	X	X	X	X							X	X	X	X	X					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	X	X	X	X	X						X	X	X	X	X					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	X	X	X	X	X						X	X	X	X	X					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	X	X	X	X	X						X	X	X	X	X					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million., Resupply Wt ≤ 3000 lb. Resupply Volume ≤ 135 C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-14 (cont.) MISSION - 026

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			X	X																
5.6.2.	76	Spoon			X	X																
5.6.2.	77	Fork			X	X																
5.6.3.	78	Comb. Spoon/Fork	X	X			X										X					
5.6.3.	79	Comb. Knife/Fk/tong	X	X			X										X					
5.6.4.	80	Knife, Disposable											X		X							
5.6.4.	81	Fork, Disposable											X		X							
5.6.4.	82	Spoon, Disposable											X		X							
5.6.5.	83	Spork, Disposable												X	X							
5.6.5.	84	Disp Comb kn/f/t												X	X							
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spobn, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	X	X	X	X	X						X	X	X	X	X					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	X	X	X	X	X						X	X	X	X	X					
6.1.3.	102	Guided Vacuum	X	X	X	X	X						X	X	X	X	X					
6.1.7.	103	Disp. Wipes Clean	X	X	X	X	X						X	X	X	X	X					
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	X	X	X	X	X						X	X	X	X	X					
6.2.1.	106	Dis. Wipes Dispen.											X	X	X	X	X					
6.2.2.	107	Reuse. Wipes Disp.	X	X	X	X	X															
6.2.3.	108	Imprg. Wipes Disp.	X	X	X	X	X						X	X	X	X	X					
6.2.4.	109	Recep. -Temp, wipes	X	X	X	X	X						X	X	X	X	X					
6.2.8.	110	Tray ret., Hand Carr.	X	X	X	X							X	X	X	X	X					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					X															
6.3.1.	113	Temp Reuse Wipe Stor.	X	X	X	X	X						X	X	X	X	X					
6.3.2.	114	Temp Debris Storage	X	X	X	X	X						X	X	X	X	X					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs., Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million., Resupply Wt ≤ 3000 lb. Resupply Volume ≤ 135 C.F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 14 (cont.) MISSION - 026

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	X	X	X	X	X						X	X	X	X	X					
6.3.13.	118	Auto Dish Wash/Dry	X	X	X	X	X						X	X	X	X	X					
6.3.14.	119	Disp-Ut. Wipes-Disp.											X	X	X	X	X					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	X	X	X	X	X															
6.3.16.	121	Stowage of Equip.	X	X	X	X	X						X	X	X	X	X					
6.3.6.	115	Hand Debr. Xporter	X	X	X	X	X						X	X	X	X	X					
7.1.1.	125	Inventory	X	X	X	X	X						X	X	X	X	X					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11million, Resupply Wt ≤3000 Resupply Volume ≤ 135C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-15

MISSION - 027

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13						201	195	273	267	207					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer																				
2.1.7.	5	Thermoel Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x						x	x			x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 CF , Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb Resupply Volume ≤ 135 CF, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-15 (cont'd)

MISSION - 027

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender		x		x									x	x						
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x		x					
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x						x	x	x		x					
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x						x	x	x		x					
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs., Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000#. Resupply Volume ≤ 135 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-15 (Cont'd) MISSION - 027

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x																
5.6.2.	76	Spoon			x	x																
5.6.2.	77	Fork			x	x																
5.6.3.	78	Comb. Spoon/Fork	x	x			x										x					
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x										x					
5.6.4.	80	Knife, Disposable											x		x							
5.6.4.	81	Fork, Disposable											x		x							
5.6.4.	82	Spoon, Disposable											x		x							
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x	x					
6.1.8.	104	Reusable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.																				
6.2.2.	107	Reuse. Wipes Disp.	x	x	x	x	x															
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000#. Resupply Volume ≤ 135 C. F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-15 (Cont'd) MISSION - 029

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.																				
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000# Resupply Volume ≤ 135 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 16

MISSION - 028

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13						201	195	273	267	207					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer																				
2.1.7.	5	Thermoel Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x						x	x			x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lbs
Resupply Volume ≤ 135 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-16 (continued)

MISSION - 028

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender		x		x									x	x						
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x		x					
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x						x	x	x		x					
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x						x	x	x		x					
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* **Basic Constraints** = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million., Resupply Wt ≤ 3000 lbs
Resupply Volume ≤ 135 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 16 (continued) MISSION - 028

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x																
5.6.2.	76	Spoon			x	x																
5.6.2.	77	Fork			x	x																
5.6.3.	78	Comb. Spoon/Fork	x	x			x										x					
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x										x					
5.6.4.	80	Knife, Disposable											x		x							
5.6.4.	81	Fork, Disposable											x		x							
5.6.4.	82	Spoon, Disposable											x		x							
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x	x					
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.																				
6.2.2.	107	Reuse. Wipes Disp.	x	x	x	x	x															
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x	x						x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C. F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lbs Resupply Volume ≤ 135 C. F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 16 (continued) MISSION - 028

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤650 lbs , Volume ≤100 C. F. , Power ≤35000 Watts, Cost ≤ $11 million , Resupply Wt ≤ 3000 lbs
Resupply Volume ≤ 135 CF, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 17

MISSION - 029

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13						201	195	273	267	207					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer																				
2.1.7.	5	Thermoel Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x						x	x			x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F, Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lbs
Resupply Volume ≤ 135 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-17 (Cont'd)

MISSION - 029

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender		x		x									x	x						
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x		x					
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x						x	x	x		x					
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x						x	x	x		x					
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb Resupply Volume ≤ 135 C.F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 17 (Cont'd) MISSION - 029

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x																
5.6.2.	76	Spoon			x	x																
5.6.2.	77	Fork			x	x																
5.6.3.	78	Comb. Spoon/Fork	x	x			x										x					
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x										x					
5.6.4.	80	Knife, Disposable											x		x							
5.6.4.	81	Fork, Disposable											x		x							
5.6.4.	82	Spoon, Disposable											x		x							
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x	x					
6.1.8.	104	Reuscable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.											x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.	x	x	x	x	x															
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤35000 Watts, Cost ≤ $11 million., Resupply Wt ≤3000 lb
Resupply Volume ≤135 C.F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 17 (Cont'd) MISSION - 029

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 lb Resupply Volume ≤ 135 C.F, Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-18

MISSION - 030

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			3	51	9	57	13	16	64	22	70	112	201	195	273	267	207	217	211	289	283	223
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer						x	x	x	x	x										
2.1.7.	5	Thermoel Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.										x										
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.																				
3.8.2.	34	Hand Kneading	x		x		x	x		x		x	x	x			x	x	x			x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 Resupply Volume ≤ 135 C.F Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-18 (Cont.)

MISSION - 030

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender		x		x			x		x				x	x				x	x	
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor																				
3.11.2.	45	Mag. Conveyor																				
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart																				
3.11.5.	48	Net Type Bag	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
3.11.7.	49	Fd. Handling Tongs	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*** Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ $11 million, Resupply Wt ≤ 3000 Resupply Volume ≤ 135 C.F, Crew Req. ≤ 35 manhours/day.**

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-18 (Cont.) MISSION - 030

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife			x	x				x	x											
5.6.2.	76	Spoon			x	x				x	x											
5.6.2.	77	Fork			x	x				x	x											
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x					x					x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x					x					x
5.6.4.	80	Knife, Disposable											x		x			x		x		
5.6.4.	81	Fork, Disposable											x		x			x		x		
5.6.4.	82	Spoon, Disposable											x		x			x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spobn, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic																				
5.8.1.	89	Comb k/f/t. Mag.																				
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.	x	x	x	x	x															
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x	x						x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x						x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤100 C.F., Power ≤35000 Watts, Cost ≤ $11 million, Resupply Wt ≤3000 Resupply Volume ≤135 C.F, Crew Req. ≤35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-18 (Cont.) MISSION - 030

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 650 lbs, Volume ≤ 100 C.F., Power ≤ 35000 Watts, Cost ≤ 11 million , Resupply Wt ≤ 3000 Resupply Volume ≤ 135 C.F. Crew Req. ≤ 35 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 19

MISSION - 031

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	237	231	201	195	240
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer										
2.1.8.	6	Freezer, Turb/Comp										
2.2.4.	7	Wat. Sub. Refrig										
2.2.6.	8	Sp Rad. Refrig.										
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp										
2.3.1.	11	Amb. Stor, - Rigid										
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven										
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven										
3.2.14.	18	Hot Air/Rad. Oven										
3.2.15.	19	Heated Food Tray										
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter										
3.4.2.	24	Counter with Power										
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top										
3.4.5.	27	Prep. & Serv. Count.										
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.										
3.7.1.	30	Fd. Stor. Cab.										
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.										
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading										

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5
System Number												
1.1.1	1	Food Mix										
2.1.6.	4	Spc Rad. Freezer										
2.1.7.	5	Thermoel Freezer										
2.1.8.	6	Freezer, Turb/Comp										
2.2.4.	7	Wat. Sub. Refrig										
2.2.6.	8	Sp Rad. Refrig.										
2.2.7.	9	Thermoel, Refrig										
2.2.8.	10	Refrig, Turb/Comp										
2.3.1.	11	Amb. Stor, - Rigid										
2.3.2.	12	Amb. Stor, - Flex.										
3.2.1.	15	Hot Air Oven										
3.2.6.	16	Self-Heating Pack										
3.2.13.	17	Micro/Radiant Oven										
3.2.14.	18	Hot Air/Rad. Oven										
3.2.15.	19	Heated Food Tray										
3.3.1.	20	Food Warming Plate										
3.3.2.	21	Reconstitution Mach.										
3.3.3.	22	Cold Display Cab.										
3.4.1.	23	Prep. Counter										
3.4.2.	24	Counter with Power										
3.4.3.	25	Fold Away Counter										
3.4.4	26	Serv Cart Count, Top										
3.4.5.	27	Prep. & Serv. Count.										
3.5.1.	28	Snack Bar										
3.6.1.	29	Fd. Dispens. Cab.										
3.7.1.	30	Fd. Stor. Cab.										
3.7.2.	31	Self-Stor. Cab.										
3.7.3	32	Auto Stor. Cab.										
3.8.1.	33	Kneader-Mech.										
3.8.2.	34	Hand Kneading										

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 19 (Cont.) MISSION - 031

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x						x	x	x	x	x					
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor	x		x		x						x	x			x					
3.11.2.	45	Mag. Conveyor		x		x									x	x						
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x	x	x					
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x						x	x	x	x	x					
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-19 (cont.)

MISSION - 031

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x			x															
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x															
5.6.4.	80	Knife, Disposable											x		x		x					
5.6.4.	81	Fork, Disposable											x		x		x					
5.6.4.	82	Spoon, Disposable											x		x		x					
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x																
5.8.1.	89	Comb k/f/t. Mag.			x	x																
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x						
6.1.8.	104	Reuscable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x						x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤1150 lb, Volume ≤150 C.F., Power ≤40000 Watts, Cost ≤11.5million, Resupply Wt ≤6000 Resupply Volume ≤300C.F, Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 19 (Cont.) MISSION - 031

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤1150 lb, Volume ≤150 C.F., Power ≤40000 Watts, Cost ≤11.5 million, Resupply Wt ≤6000 Resupply Volume ≤ 300C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-20

MISSION - 032

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37						237	231	201	195	240					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x						x	x	x	x	x					
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 20 (cont'd) MISSION - 032

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x						x	x	x	x	x					
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor	x		x		x						x	x			x					
3.11.2.	45	Mag. Conveyor		x		x									x	x						
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x	x	x					
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x						x	x	x	x	x					
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C. F. Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 20 (cont'd) MISSION - 032

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x			x															
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x															
5.6.4.	80	Knife, Disposable											x		x		x					
5.6.4.	81	Fork, Disposable											x		x		x					
5.6.4.	82	Spoon, Disposable											x		x		x					
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spobn, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x																
5.8.1.	89	Comb k/f/t. Mag.			x	x																
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x	x					
6.1.8.	104	Reuseable Wipes Cl.																				
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x						x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-20 (cont'd) MISSION - 032

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.																				
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x						x	x	x	x	x					
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ 11.5 Million, Resupply Wt ≤ 6000 Resupply Volume ≤ 300 C.F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-21

MISSION - 033

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37						237	231	201	195	240					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x						x	x	x	x	x					
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 mill., Resupply Wt ≤ 3000 lb Resupply Volume ≤ 300 C. F. Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-21 (Contd)

MISSION - 033

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x						x	x	x	x	x					
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor	x		x		x						x	x			x					
3.11.2.	45	Mag. Conveyor		x		x									x	x						
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x	x	x					
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x						x	x	x	x	x					
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ $11.5 mill., Resupply Wt ≤ 3000 lb Resupply Volume ≤ 300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-21 (contd)

MISSION - 033

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x			x															
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x															
5.6.4.	80	Knife, Disposable											x		x		x					
5.6.4.	81	Fork, Disposable											x		x		x					
5.6.4.	82	Spoon, Disposable											x		x		x					
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x																
5.8.1.	89	Comb k/f/t. Mag.			x	x																
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x						
6.1.8.	104	Reuscable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x						x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤150 C. F., Power ≤40000 Watts, Cost ≤$11.5 mill., Resupply Wt ≤3000 lb Resupply Volume ≤300 C. F, Crew Req. ≤45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-21 (contd) MISSION -033

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C. F. , Power ≤ 40000 Watts, Cost ≤ $11. 5 mill , Resupply Wt ≤ 3000 lb Resupply Volume ≤ 300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 22

MISSION - 034

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37						237	231	201	195	240					
1.1.1	1	Food Mix	x	x	x	x	x						x	x	x	x	x					
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x						x	x	x	x	x					
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x						x	x	x	x	x					
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x						x	x	x	x	x					
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x						x	x	x	x	x					
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x						x	x	x	x	x					
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x						x	x	x	x	x					
3.3.3.	22	Cold Display Cab.	x	x	x	x	x						x	x	x	x	x					
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x						x	x	x	x	x					
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x						x	x	x	x	x					
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x						x	x	x	x	x					
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x						x	x	x	x	x					
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 3000 lbs Resupply Volume ≤ 300 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 22 (Cont'd)

MISSION - 034

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x						x	x	x	x	x					
3.8.4.	36	Clam Shell Device	x	x	x	x	x						x	x	x	x	x					
3.8.7.	37	Scoop	x	x	x	x	x						x	x	x	x	x					
3.8.9.	38	Utility Shears	x	x	x	x	x						x	x	x	x	x					
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x						x	x	x	x	x					
3.8.11.	40	Spatula	x	x	x	x	x						x	x	x	x	x					
3.8.12.	41	Food Chopper	x	x	x	x	x						x	x	x	x	x					
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x						x	x	x	x	x					
3.10.3.	43	Waist Restraint	x	x	x	x	x						x	x	x	x	x					
3.11.1.	44	Fd. Xport Conveyor	x		x		x						x	x			x					
3.11.2.	45	Mag. Conveyor		x		x									x	x						
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x						x	x	x	x	x					
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x						x	x	x	x	x					
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x															
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x															
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x						x	x	x	x	x					
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x						x	x	x	x	x					
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 3000lb Resupply Volume ≤ 300C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 22 (Cont'd) MISSION - 034

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x			x															
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x															
5.6.4.	80	Knife, Disposable											x		x		x					
5.6.4.	81	Fork, Disposable											x		x		x					
5.6.4.	82	Spoon, Disposable											x		x		x					
5.6.5.	83	Spork, Disposable												x		x						
5.6.5.	84	Disp Comb kn/f/t												x		x						
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spobn, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x																
5.8.1.	89	Comb k/f/t. Mag.			x	x																
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x						x	x	x	x	x					
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.3.	102	Guided Vacuum	x	x	x	x	x						x	x	x	x	x					
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x						x	x	x	x						
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x						x	x	x	x	x					
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x						x	x	x	x	x					
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x						x	x	x	x	x					
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x						x	x	x	x	x					
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x															
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x						x	x	x	x	x					
6.3.2.	114	Temp Debris Storage	x	x	x	x	x						x	x	x	x	x					
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤1150 lbs Volume ≤ 150 C.F., Power ≤40000 Watts, Cost ≤$11.5 million Resupply Wt ≤3000lb. Resupply Volume ≤ 300 C.F. Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 22 (Cont'd) MISSION - 034

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x						x	x	x	x	x					
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x						x	x	x	x	x					
6.3.14.	119	Disp-Ut. Wipes-Disp.											x	x	x	x	x					
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x						x	x	x	x	x					
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x						x	x	x	x	x					
7.1.1.	125	Inventory	x	x	x	x	x						x	x	x	x	x					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 3000lb Resupply Volume ≤ 300 C.F., Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-23

MISSION - 035

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	40	16	46	22	88	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs. Volume ≤ 150 C. F. , Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 3000lb. Resupply Volume ≤ 300C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 23 (cont.)

MISSION - 035

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x			x	x			x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x				x	x				x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C. F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 3000 Resupply Volume ≤ 300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-23 (cont.) MISSION - 035

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife										
5.6.2.	76	Spoon										
5.6.2.	77	Fork										
5.6.3.	78	Comb. Spoon/Fork	x	x			x					
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x					
5.6.4.	80	Knife, Disposable						x		x		x
5.6.4.	81	Fork, Disposable						x		x		x
5.6.4.	82	Spoon, Disposable						x		x		x
5.6.5.	83	Spork, Disposable							x		x	
5.6.5.	84	Disp Comb kn/f/t							x		x	
5.8.1.	85	Magnetic Knife										
5.8.1.	86	Spoon, Magnetic										
5.8.1.	87	Fork, Magnetic										
5.8.1.	88	Spork, Magnetic			x	x						
5.8.1.	89	Comb k/f/t. Mag.			x	x						
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint										
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.										
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.										
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x		x	x					
6.2.9.	111	Tray Ret Rail Sys.										
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter										

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5
5.6.2.	75	Knife					
5.6.2.	76	Spoon					
5.6.2.	77	Fork					
5.6.3.	78	Comb. Spoon/Fork					x
5.6.3.	79	Comb. Knife/Fk/tong					x
5.6.4.	80	Knife, Disposable	x		x		
5.6.4.	81	Fork, Disposable	x		x		
5.6.4.	82	Spoon, Disposable	x		x		
5.6.5.	83	Spork, Disposable		x		x	
5.6.5.	84	Disp Comb kn/f/t		x		x	
5.8.1.	85	Magnetic Knife					
5.8.1.	86	Spoon, Magnetic					
5.8.1.	87	Fork, Magnetic					
5.8.1.	88	Spork, Magnetic					
5.8.1.	89	Comb k/f/t. Mag.					
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x
5.9.3.	91	Lap Restraint					
6.1.2.	101	Hand Vacuum	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.					
6.1.10.	105	Astrovac	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.					
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.					
6.2.9.	111	Tray Ret Rail Sys.					
6.2.10.	112	Tray Ret Carrier	x	x	x	x	x
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x
6.3.7.	116	Push Debris Xporter					

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lb, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ 11.5 million, Resupply Wt ≤ 3000 Resupply Volume ≤ 300 C.F, Crew Req. ≤ 45 manhours/day.

TABLE V-1- 23 (cont.) MISSION - 035

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤1150 lb , Volume ≤150 C. F. , Power ≤40000 Watts, Cost ≤11. 5 million Resupply Wt ≤3000 Resupply Volume ≤300 C. F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 24

MISSION - 036

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
System Number			27	3	33	9	37	40	16	46	22	88	237	231	201	195	240	253	247	217	211	259
1.1.1	1	Food Mix	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.6.	4	Spc Rad. Freezer	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.7.	5	Thermoel Freezer																				
2.1.8.	6	Freezer, Turb/Comp																				
2.2.4.	7	Wat. Sub. Refrig																				
2.2.6.	8	Sp Rad. Refrig.																				
2.2.7.	9	Thermoel, Refrig	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.2.8.	10	Refrig, Turb/Comp																				
2.3.1.	11	Amb. Stor, - Rigid																				
2.3.2.	12	Amb. Stor, - Flex.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.1.	15	Hot Air Oven																				
3.2.6.	16	Self-Heating Pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3.2.13.	17	Micro/Radiant Oven																				
3.2.14.	18	Hot Air/Rad. Oven																				
3.2.15.	19	Heated Food Tray																				
3.3.1.	20	Food Warming Plate	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.3.2.	21	Reconstitution Mach.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.3.3.	22	Cold Display Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.4.1.	23	Prep. Counter																				
3.4.2.	24	Counter with Power																				
3.4.3.	25	Fold Away Counter	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.4.4	26	Serv Cart Count, Top																				
3.4.5.	27	Prep. & Serv. Count.																				
3.5.1.	28	Snack Bar	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.6.1.	29	Fd. Dispens. Cab.																				
3.7.1.	30	Fd. Stor. Cab.																				
3.7.2.	31	Self-Stor. Cab.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.7.3	32	Auto Stor. Cab.																				
3.8.1.	33	Kneader-Mech.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.2.	34	Hand Kneading																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150 lbs, Volume ≤ 150 C.F. , Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 3000lbs
Resupply Volume ≤ 300C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1-24 (Cont'd)

MISSION - 036

STUDY NO.	SERIAL NO.	NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
3.8.3.	35	Hot Fd. Tongs	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.4.	36	Clam Shell Device	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.7.	37	Scoop	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.9.	38	Utility Shears	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.10.	39	Hand Mixer-Blender	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.11.	40	Spatula	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.8.12.	41	Food Chopper	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.9.1.	42	Cont. Spill. Mod.	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.10.3.	43	Waist Restraint	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.1.	44	Fd. Xport Conveyor	x		x		x	x		x			x	x		x	x	x	x			x
3.11.2.	45	Mag. Conveyor		x		x			x		x		x	x			x			x	x	
3.11.3.	46	Mech. Rail Xport	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.4.	47	Dolly Guided Cart	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
3.11.5.	48	Net Type Bag																				
3.11.7.	49	Fd. Handling Tongs																				
4.1.1.	55	Self Service	x	x	x	x							x	x	x	x	x					
4.1.2.	56	Steward Service					x	x	x	x	x	x						x	x	x	x	x
4.1.3.	57	Tray/Rail Conveyor																				
4.1.6.	58	None (eat in galley)	x	x	x	x							x	x	x	x	x					
4.1.7.	59	Tray Rack/Rail Con.					x	x	x	x	x	x						x	x	x	x	x
4.2.1.	60	Storage Rack	x	x	x	x							x	x	x	x	x					
5.4.1.	65	Tray/Recesses																				
5.4.3.	66	Tray/spiked, ribbed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.4.	67	Cohesive Food																				
5.4.5.	68	Bite sized Food	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.4.6.	69	Package Contain.																				
5.4.7.	70	Covered Tray																				
5.4.11.	71	Edible Coating																				
5.5.2.	72	Pos. Dis. Drink																				
5.5.2.	73	Drinking Cup																				
5.5.3.	74	In-Pack. Liq. Rest.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150lbs, Volume ≤ 150C.F., Power ≤ 40000 Watts, Cost ≤ $11.5 million, Resupply Wt ≤ 3000lbs, Resupply Volume ≤ 300 C.F, Crew Req. ≤ 45 manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 24 (Cont'd) MISSION - 036

STUDY NO.	SERIAL NO.	EQUIPMENT NAME	INDEX = MIN (WT + VOL + RES WT + RES VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL + RES WT + RES VOL) BASIC* CONSTRAINTS					INDEX = MIN (WT + VOL) NO CONSTRAINTS					INDEX = MIN (WT + VOL) BASIC* CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
5.6.2.	75	Knife																				
5.6.2.	76	Spoon																				
5.6.2.	77	Fork																				
5.6.3.	78	Comb. Spoon/Fork	x	x			x	x	x			x										x
5.6.3.	79	Comb. Knife/Fk/tong	x	x			x	x	x			x										x
5.6.4.	80	Knife, Disposable											x		x		x	x		x		
5.6.4.	81	Fork, Disposable											x		x		x	x		x		
5.6.4.	82	Spoon, Disposable											x		x		x	x		x		
5.6.5.	83	Spork, Disposable												x		x			x		x	
5.6.5.	84	Disp Comb kn/f/t												x		x			x		x	
5.8.1.	85	Magnetic Knife																				
5.8.1.	86	Spoon, Magnetic																				
5.8.1.	87	Fork, Magnetic																				
5.8.1.	88	Spork, Magnetic			x	x				x	x											
5.8.1.	89	Comb k/f/t. Mag.			x	x				x	x											
5.9.3.	90	Stom. Supt. Restr.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5.9.3.	91	Lap Restraint																				
6.1.2.	101	Hand Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.3.	102	Guided Vacuum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.1.7.	103	Disp. Wipes Clean	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x
6.1.8.	104	Reuseable Wipes Cl.															x					
6.1.10.	105	Astrovac	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.1.	106	Dis. Wipes Dispen.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.2.	107	Reuse. Wipes Disp.																				
6.2.3.	108	Imprg. Wipes Disp.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.4.	109	Recep. -Temp, wipes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.2.8.	110	Tray ret., Hand Carr.	x	x	x	x							x	x	x	x	x					
6.2.9.	111	Tray Ret Rail Sys.																				
6.2.10.	112	Tray Ret Carrier					x	x	x	x	x	x										
6.3.1.	113	Temp Reuse Wipe Stor.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.2.	114	Temp Debris Storage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.7.	116	Push Debris Xporter																				

* Basic Constraints = CR. ACC ≥ 6, WT ≤ 1150lbs, Volume ≤ 150 C.F., Power ≤ 40000 Watts, Cost ≤ $11.5 million Resupply Wt ≤ 3000lb Resupply Volume ≤ 300 C.F. Crew Req. ≤ 45manhours/day.

OPTIMAL FOOD SYSTEMS SUMMARY

TABLE V-1- 24 (Cont'd) MISSION - 036

EQUIPMENT			INDEX = MIN (WT + VOL + RES WT + RES VOL)										INDEX = MIN (WT + VOL)									
STUDY NO.	SERIAL NO.	NAME	NO CONSTRAINTS					BASIC* CONSTRAINTS					NO CONSTRAINTS					BASIC * CONSTRAINTS				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.3.11.	117	Galley Sink	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.13.	118	Auto Dish Wash/Dry	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.14.	119	Disp-Ut. Wipes-Disp.						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.15.	120	Disp-Ut. Wipes-Reuse.	x	x	x	x	x															
6.3.16.	121	Stowage of Equip.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6.3.6.	115	Hand Debr. Xporter	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7.1.1.	125	Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* Basic Constraints = CR. ACC ≥ 6, WT ≤1150lbs, Volume ≤ 150C.F. , Power ≤40000 Watts, Cost ≤$11.5 million Resupply Wt ≤3000lb Resupply Volume ≤ 300 C.FCrew Req. ≤ 45 manhours/day.

Optimal Systems Summary by Mission

TABLE V-2-1

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - None

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C.F.)	Crew Req. Manhr/Day
	Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	187	244	274	298	6.7	595.4	95.7	10431	416.1	20.346	46.0
2	14	6	20/80	C	1	7	78	187	244	274	298	6.9	554.1	86.4	10431	442.1	16.326	46.0
3	14	6	60/40	B	1	7	78	187	244	274	298	6.6	548.3	85.4	10431	314.8	15.476	46.0
4	14	6	60/40	C	1	7	78	187	244	274	298	6.6	521m8	79.1	10431	327.8	13.4360	46.0
5	14	6	85/15	B	1	7	78	187	244	274	298	6.5	512.3	77.5	10431	251.3	12.3960	46.0
6	14	6	85/15	C	1	7	78	187	244	274	298	6.5	500.8	74.9	10431	256.8	11.6410	46.0
7	14	12	20/80	B	1	7	78	187	244	274	298	6.8	819.3	140.1	11331	797.0	39.3240	59.3
8	14	12	20/80	C	1	7	78	187	244	274	298	6.9	754.1	124.9	11331	849.2	31.2240	59.3
9	14	12	60/40	B	1	7	78	187	244	274	298	6.6	752.0	124.3	11331	594.4	29.7240	59.3
10	14	12	60/40	C	1	7	78	187	244	274	298	6.6	710.7	115.0	11331	620.5	25.4940	59.3
11	14	12	85/15	B	1	7	78	187	244	274	298	6.5	692.6	111.9	11331	467.4	23.4140	59.3
12	14	12	85/15	C	1	7	78	187	244	274	298	6.5	671.5	106.5	11331	477.2	21.8640	59.3
25	90	6	20/80	B	1	15	78	187	244	274	298	6.7	656.1	162.5	10457	2622.9	125.9440	49.3
26	90	6	20/80	C	1	7	78	187	244	274	298	6.9	763.9	129.7	10437	2789.7	99.8940	49.3
27	90	6	60/40	B	1	7	78	187	244	280	298	6.6	753.5	131.2	10437	1970.6	94.4540	49.3
28	90	6	60/40	C	1	7	78	187	244	280	298	6.6	682.9	109.0	10437	2055.5	81.4540	49.3
29	90	6	85/15	B	1	7	78	187	244	280	298	6.4	648.8	105.6	10437	1563.4	74.7640	48.1
30	90	6	85/15	C	1	7	78	187	244	280	298	6.4	603.4	90.4	10437	1594.3	69.8440	48.0
31	90	12	20/80	B	1	7	78	187	244	280	298	6.8	1244.0	238.6	11336	5035.4	243.3620	59.3
32	90	12	20/80	C	1	7	78	187	244	280	298	6.9	1073.1	189.9	11336	5371.0	191.6420	59.3
33	90	12	60/40	B	1	7	78	187	244	280	298	6.6	1040.2	182.0	11336	3732.4	180.6220	59.3
34	90	12	60/40	C	1	7	78	187	244	280	298	6.6	943.3	158.4	11336	3902.4	154.7920	59.3
35	90	12	85/15	B	1	7	78	187	244	280	298	6.5	900.4	145.9	11336	2916.7	141.3220	59.3
36	90	12	85/15	C	1	7	78	187	244	280	298	6.5	836.8	131.4	11336	2980.5	131.9120	59.3

Optimal Systems Summary by Mission

TABLE V-2-2

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - As per table M-WVRR-1

No.	Mission: Mission Resupply (Days)	Mission: Crew (Men)	Mission: H_2O Bal.	Mission: Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
1	14	6	20/80	B	1	7	78	189	244	278	298	6.9	600.4	96.2	10521	416.1	20.346	29.3
2	14	6	20/80	C	1	7	78	189	244	278	298	7.1	559.1	86.9	10521	442.1	16.326	29.3
3	14	6	60/40	B	1	7	78	189	244	278	298	6.8	553.3	85.9	10521	314.8	15.476	29.3
4	14	6	60/40	C	1	7	78	189	244	278	298	6.8	526.8	79.6	10521	327.8	13.4360	29.3
5	14	6	85/15	B	1	7	78	189	244	278	298	6.6	517.3	78.0	10521	251.3	12.3960	29.3
6	14	6	85/15	C	1	7	78	189	244	278	298	6.6	505.8	75.4	10521	256.8	11.6410	29.3
7	14	12	20/85	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B			NONE					-	-	-	-	-	-	-
26	90	6	20/80	C			NONE					-	-	-	-	-	-	-
27	90	6	60/40	B			NONE					-	-	-	-	-	-	-
28	90	6	60/40	C			NONE					-	-	-	-	-	-	-
29	90	6	85/15	B			NONE					-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	189	244	278	298	6.6	579.4	90.2	10523	1625.9	74.3130	31.3
31	90	12	20/80	B			NONE					-	-	-	-	-	-	-
32	90	12	20/80	C			NONE					-	-	-	-	-	-	-
33	90	12	60/40	B			NONE					-	-	-	-	-	-	-
34	90	12	60/40	C			NONE					-	-	-	-	-	-	-
35	90	12	85/15	B	1	7	78	189	244	278	298	6.7	851.3	145.1	11439	2973.1	149.1500	42.6
36	90	12	85/15	C	1	7	78	189	244	278	298	6.7	787.7	130.6	11439	3036.8	139.7400	42.6

Optimal Systems Summary by Mission

TABLE V-2-3

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - As per Table M-WVRR-2

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	187	244	274	298	6.7	595.4	95.7	10431	416.1	20.346	46.0
2	14	6	20/80	C	1	7	78	187	244	274	298	6.9	554.1	86.4	10431	442.1	16.326	46.0
3	14	6	60/40	B	1	7	78	187	244	274	298	6.6	548.3	85.4	10431	314.8	15.476	46.0
4	14	6	60/40	C	1	7	78	187	244	274	298	6.6	521.8	79.1	10431	327.8	13.4360	46.0
5	14	6	85/15	B	1	7	78	187	244	274	298	6.5	512.3	77.5	10431	251.3	12.3960	46.0
6	14	6	85/15	C	1	7	78	187	244	274	298	6.5	500.8	74.9	10431	256.8	11.6410	46.0
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B				NONE				-	-	-	-	-	-	-
26	90	6	20/80	C				NONE				-	-	-	-	-	-	-
27	90	6	60/40	B				NONE				-	-	-	-	-	-	-
28	90	6	60/40	C				NONE				-	-	-	-	-	-	-
29	90	6	85/15	B				NONE				-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	187	246	274	298	6.4	574.4	89.7	10433	1625.9	74.3130	48.0
31	90	12	20/80	B				NONE				-	-	-	-	-	-	-
32	90	12	20/80	C				NONE				-	-	-	-	-	-	-
33	90	12	60/40	B				NONE				-	-	-	-	-	-	-
34	90	12	60/40	C				NONE				-	-	-	-	-	-	-
35	90	12	85/15	B	1	7	78	187	244	274	298	6.5	846.3	144.6	11331	1973.1	149.1500	59.3
36	90	12	85/15	C	1	7	78	187	244	274	298	6.5	782.7	130.1	11331	3036.8	139.7400	59.3

Optimal Systems Summary by Mission

TABLE V-2- 4

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - as per M-WVRR-3

Mission No.	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
1	14	6	20/80	B	1	7	78	189	244	278	298	6.9	600.4	96.2	10521	416.1	20.3460	29.3
2	14	6	20/80	C	1	7	78	189	244	278	298	7.1	559.1	86.9	10521	442.1	16.326	29.3
3	14	6	60/40	B	1	7	78	189	244	278	298	6.8	553.3	85.9	10521	314.8	15.476	29.3
4	14	6	60/40	C	1	7	78	189	244	278	298	6.8	526.8	79.6	10521	327.8	13.4360	29.3
5	14	6	85/15	B	1	7	78	189	244	278	298	6.6	517.3	78.0	10521	251.3	12.3960	29.3
6	14	6	85/15	C	1	7	78	189	244	278	298	6.6	505.8	75.4	10521	256.8	11.6410	29.3
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.8	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B	1	15	78	189	244	278	298	6.9	632.1	162.3	10543	2654.5	130.4130	32.7
26	90	6	20/80	C				N	O	N	E	-	-	-	-	-	-	-
27	90	6	60/40	B				N	O	N	E	-	-	-	-	-	-	-
28	90	6	60/40	C				N	O	N	E	-	-	-	-	-	-	-
29	90	6	85/15	B	1	7	78	189	244	278	298	6.6	624.8	105.5	10543	1595.0	79.2330	31.5
30	90	6	85/15	C	1	7	78	189	244	278	298	6.6	579.4	90.2	10523	1625.0	74.3130	31.3
31	90	12	20/80	B				N	O	N	E	-	-	-	-	-	-	-
32	90	12	20/80	C	1	7	78	189	244	278	298	7.1	1024.0	189.1	11439	5427.3	199.4700	42.6
33	90	12	60/40	B	1	7	78	189	244	278	298	6.8	991.1	181.2	11439	3788.8	188.4500	42.6
34	90	12	60/40	C	1	7	78	189	244	278	298	6.8	894.2	157.6	11439	3958.7	162.6200	42.6
35	90	12	85/15	B	1	7	78	189	244	278	298	6.7	851.3	145.1	11439	2973.1	149.1500	42.6
36	90	12	85/15	C	1	7	78	189	244	278	298	6.7	787.7	130.6	11439	3036.8	139.7400	42.6

Optimal Systems Summary by Mission

TABLE V-2- 5

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - as per M0WVRR-4

No.	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission																	
1	14	6	20/80	B	1	7	78	187	244	274	298	6.7	595.4	95.7	10431	416.1	20.346	46.0
2	14	6	20/80	C	1	7	78	187	244	274	298	6.9	554.1	86.4	10431	442.1	16.326	46.0
3	14	6	60/40	B	1	7	78	187	244	274	298	6.6	548.3	85.4	10431	314.8	15.476	46.0
4	14	6	60/40	C	1	7	78	187	244	274	298	6.6	521.8	79.1	10431	327.8	13.4360	46.0
5	14	6	85/15	B	1	7	78	187	244	274	298	6.5	512.3	77.5	10431	251.3	12.3960	46.0
6	14	6	85/15	C	1	7	78	187	244	274	298	6.5	500.8	74.9	10431	256.8	11.6410	46.0
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	60/40	B	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B	1	15	78	187	244	274	298	6.7	627.1	161.8	10453	2654.5	130.4130	49.3
26	90	6	20/80	C				N	O	N	E	-	-	-	-	-	-	-
27	90	6	60/40	B				N	O	N	E	-	-	-	-	-	-	-
28	90	6	60/40	C				N	O	N	E	-	-	-	-	-	-	-
29	90	6	85/15	B	1	7	78	187	244	274	298	6.4	619.8	105.0	10433	1595.0	79.2330	48.1
30	90	6	85/15	C	1	7	78	187	244	274	298	6.4	574.4	89.7	10433	1625.9	74.3130	48.0
31	90	12	20/80	B				N	O	N	E	-	-	-	-	-	-	-
32	90	12	20/80	C	1	7	78	187	244	274	298	6.9	1019.0	188.6	11331	5427.3	199.4700	59.3
33	90	12	60/40	B	1	7	78	187	244	274	298	6.6	986.1	180.7	11331	3788.8	188.4500	59.3
34	90	12	60/40	C	1	7	78	187	244	274	298	6.6	889.2	157.1	11331	3958.7	162.6200	59.3
35	90	12	85/15	B	1	7	78	187	244	274	298	6.5	846.3	144.6	11331	2973.1	149.1500	59.3
36	90	12	85/15	C	1	7	78	187	244	274	298	6.5	782.7	130.1	11331	3036.8	139.7400	59.3

Optimal Systems Summary by Mission

TABLE V-2-6

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - As per M-WVRR-5

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	189	244	278	298	6.9	600.4	96.2	10521	416.1	20.346	29.3
2	14	6	20/80	C	1	7	78	189	244	278	298	7.1	559.1	86.9	10521	442.1	16.326	29.3
3	14	6	60/40	B	1	7	78	189	244	278	298	6.8	553.3	85.9	10521	314.8	15.476	29.3
4	14	6	60/40	C	1	7	78	189	244	278	298	6.8	526.8	79.6	10521	327.8	13.4360	29.3
5	14	6	85/15	B	1	7	78	189	244	278	298	6.6	517.3	78.0	10521	251.3	12.3960	29.3
6	14	6	85/15	C	1	7	78	189	244	278	298	6.6	505.8	75.4	10521	256.8	11.6410	29.3
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B			NONE					-	-	-	-	-	-	-
26	90	6	20/80	C			NONE					-	-	-	-	-	-	-
27	90	6	60/40	B			NONE					-	-	-	-	-	-	-
28	90	6	60/40	C			NONE					-	-	-	-	-	-	-
29	90	6	85/15	B			NONE					-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	189	244	278	298	6.6	579.4	90.2	10523	1625.9	74.3130	31.3
31	90	12	20/80	B			NONE					-	-	-	-	-	-	-
32	90	12	20/80	C			NONE					-	-	-	-	-	-	-
33	90	12	60/40	B			NONE					-	-	-	-	-	-	-
34	90	12	60/40	C			NONE					-	-	-	-	-	-	-
35	90	12	85/15	B	1	7	78	189	244	278	298	6.7	851.3	145.1	11439	2973.1	149.1500	42.6
36	90	12	85/15	C	1	7	78	189	244	278	298	6.7	787.7	130.6	11439	3036.8	139.7400	42.6

Optimal Systems Summary by Mission

TABLE V-2-7

Performance Index - Weight and Volume and Resupply Weight & Resupply Volume

Constraints * - As per M-WVRR-6

No.	Mission Resupply (Days)	Mission Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Rec. Manhr/Day
1	14	6	20/80	B	1	7	78	187	244	274	298	6.7	595.4	95.7	10431	416.1	20.346	46.0
2	14	6	20/80	C	1	7	78	187	244	274	298	6.9	554.1	86.4	10431	442.1	16.326	46.0
3	14	6	60/40	B	1	7	78	187	244	274	298	6.6	548.3	85.4	10431	314.8	15.476	46.0
4	14	6	60/40	C	1	7	78	187	244	274	298	6.6	521.8	79.1	10431	327.8	13.4360	46.0
5	14	6	85/15	B	1	7	78	187	244	274	298	6.5	512.3	77.5	10431	251.3	12.3960	46.0
6	14	6	85/15	C	1	7	78	187	244	274	298	6.5	500.8	74.9	10431	256.8	11.6410	46.0
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	1	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B			N	O	N	E		-	-	-	-	-	-	-
26	90	6	20/80	C			N	O	N	E		-	-	-	-	-	-	-
27	90	6	60/40	B			N	O	N	E		-	-	-	-	-	-	-
28	90	6	60/40	C			N	O	N	E		-	-	-	-	-	-	-
29	90	6	85/15	B			N	O	N	E		-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	187	244	274	298	6.4	574.4	89.7	10433	1625.9	74.3130	48.0
31	90	12	20/80	B			N	O	N	E		-	-	-	-	-	-	-
32	90	12	20/80	C			N	O	N	E		-	-	-	-	-	-	-
33	90	12	60/40	B			N	O	N	E		-	-	-	-	-	-	-
34	90	12	60/40	C			N	O	N	E		-	-	-	-	-	-	-
35	90	12	85/15	B	1	7	78	187	244	274	298	6.5	846.3	144.6	11331	2973.1	149.1500	59.3
36	90	12	85/15	C	1	7	78	187	244	274	298	6.5	782.7	130.1	11331	3036.8	139.7400	59.3

Optimal Systems Summary by Mission

TABLE 7-2-8

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - As per M-WVRR-7

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	189	244	278	298	6.9	600.4	96.2	10521	416.1	20.346	29.3
2	14	6	20/80	C	1	7	78	189	244	278	298	7.1	559.1	86.9	10521	442.1	16.326	29.3
3	14	6	60/40	B	1	7	78	189	244	278	298	6.8	553.3	85.9	10521	314.8	15.476	29.3
4	14	6	60/40	C	1	7	78	189	244	278	298	6.8	526.8	79.6	10521	327.8	13.4360	29.3
5	14	6	85/15	B	1	7	78	189	244	278	298	6.6	517.3	78.0	10521	251.3	12.3960	29.3
6	14	6	85/15	C	1	7	78	189	244	278	298	6.6	505.8	75.4	10521	256.8	11.6410	29.3
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B	1	15	78	189	244	278	298	6.9	632.1	162.3	10543	2654.5	130.4130	32.7
26	90	6	20/80	C	1	7	78	189	244	278	298	7.1	740.0	129.5	10523	2821.3	104.3630	32.7
27	90	6	60/40	B	1	7	78	189	244	278	298	6.8	729.6	131.0	10523	2002.2	98.9230	32.7
28	90	6	60/40	C	1	7	78	189	244	278	298	6.8	659.0	108.8	10523	2087.1	85.9230	32.7
29	90	6	85/15	B	1	7	78	189	244	278	298	6.6	624.8	105.5	10523	1595.0	79.2330	31.5
30	90	6	85/15	C	1	7	78	189	244	278	298	6.6	579.4	90.2	10523	1625.9	74.3130	31.3
31	90	12	20/80	B	1	7	78	189	244	278	298	7.0	1194.9	237.8	11439	5091.7	251.1900	42.6
32	90	12	20/80	C	1	7	78	189	244	278	298	7.1	1024.0	189.1	11439	5427.3	199.4700	42.6
33	90	12	60/40	B	1	7	78	189	244	278	298	6.8	991.1	181.2	11439	3788.8	188.4500	42.6
34	90	12	60/40	C	1	7	78	189	244	278	298	6.8	894.2	157.6	11439	3958.7	162.6200	42.6
35	90	12	85/15	B	1	7	78	189	244	278	298	6.7	851.3	145.1	11439	2973.1	149.1500	42.6
36	90	12	85/15	C	1	7	78	189	244	278	298	6.7	787.7	130.6	11439	3036.8	139.7400	42.6

* Basic Constraints = CR. ACC ≥ 6, WT ≤ , Volume ≤ , Power ≤ Watts, Cost ≤ , Resupply Wt ≤ Resupply Volume ≤ , Crew Req. ≤ manhours/day.

Optimal Systems Summary by Mission

TABLE V-2-9

Performance Index - Weight + Volume + Resupply Weight + Resupply Volume

Constraints * - As per M-WVRR-8

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	187	244	274	298	6.7	595.4	95.7	10431	416.1	20.346	46.0
2	14	6	20/80	C	1	7	78	187	244	274	298	6.9	554.1	86.4	10431	442.1	16.326	46.0
3	14	6	60/40	B	1	7	78	187	244	274	298	6.6	548.3	85.4	10431	314.8	15.476	46.0
4	14	6	60/40	C	1	7	78	187	244	274	298	6.6	521.8	79.1	10431	327.8	13.4360	46.0
5	14	6	85/15	B	1	7	78	187	244	274	298	6.5	512.3	77.5	10431	251.3	12.3960	46.0
6	14	6	85/15	C	1	7	78	187	244	274	298	6.5	500.8	74.9	10431	256.8	11.6410	46.0
7	14	12	20/80	B	1	7	78	189	244	278	298	7.0	824.3	140.6	11439	797.0	39.3240	42.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	244	278	298	6.8	757.0	124.8	11439	594.4	29.7240	42.6
10	14	12	60/40	C	1	7	78	189	244	278	298	6.8	715.7	115.5	11439	620.5	25.4940	42.6
11	14	12	85/15	B	1	7	78	189	244	278	298	6.7	697.6	112.4	11439	467.4	23.4140	42.6
12	14	12	85/15	C	1	7	78	189	244	278	298	6.7	676.6	107.0	11439	477.2	21.8640	42.6
25	90	6	20/80	B	1	15	78	187	244	274	298	6.7	627.1	161.8	10453	2654.5	130.4130	49.3
26	90	6	20/80	C	1	7	78	187	244	274	298	6.9	735.0	129.0	10433	2821.3	104.3630	49.3
27	90	6	60/40	B	1	7	78	187	244	274	298	6.6	724.6	130.5	10433	2002.2	98.9230	49.3
28	90	6	60/40	C	1	7	78	187	244	274	298	6.6	654.0	108.3	10433	2087.1	85.9230	49.3
29	90	6	85/15	B	1	7	78	187	244	274	298	6.4	619.8	105.0	10433	1595.0	79.2330	48.1
30	90	6	85/15	C	1	7	78	187	244	274	298	6.4	574.4	89.7	10433	1625.9	74.3130	48.0
31	90	12	20/80	B	1	7	78	187	244	274	298	6.8	1189.9	137.3	11331	5091.7	251.1900	59.3
32	90	12	20/80	C	1	7	78	187	244	274	298	6.9	1019.0	188.6	11331	5427.3	199.4700	59.3
33	90	12	60/40	B	1	7	78	187	244	274	298	6.6	986.1	180.7	11331	3788.8	188.4500	59.3
34	90	12	60/40	C	1	7	78	187	244	274	298	6.6	889.2	157.1	11331	3958.7	162.6200	59.3
35	90	12	85/15	B	1	7	78	187	244	274	298	6.5	846.3	144.6	11331	2973.1	149.1500	59.3
36	90	12	85/15	C	1	7	78	187	244	274	298	6.5	782.7	130.1	11331	3036.8	139.7400	59.3

Optimal Systems Summary by Mission

TABLE V-2-10

Performance Index - Weight + Volume

Constraints * - None

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C.F.)	Crew Rec. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	187	240	274	298	6.8	594.6	95.6	10376	420.7	23.366	48.0
2	14	6	20/80	C	1	7	78	187	240	274	298	7.0	553.3	86.4	10376	446.6	19.3460	48.0
3	14	6	60/40	B	1	7	78	187	240	274	298	6.7	574.4	85.4	10376	319.3	18.4960	48.0
4	14	6	60/40	C	1	7	78	187	240	274	298	6.7	520.9	79.1	10376	332.3	16.4560	48.0
5	14	6	85/15	B	1	7	78	187	240	274	298	6.6	511.4	77.4	10376	255.8	15.4160	48.0
6	14	6	85/15	C	1	7	78	187	240	274	298	6.6	499.9	74.8	10376	261.8	14.6610	48.0
7	14	12	20/80	B	1	7	78	187	240	274	298	6.9	817.5	140.0	11276	806.1	40.8240	61.3
8	14	12	20/80	C	1	7	78	187	240	274	298	7.0	752.3	124.8	11276	858.3	32.7240	61.3
9	14	12	60/40	B	1	7	78	187	240	274	298	6.7	750.2	124.2	11276	603.5	31.2240	61.3
10	14	12	60/40	C	1	7	78	187	240	274	298	6.7	708.9	114.9	11276	629.6	26.9940	61.3
11	14	12	85/15	B	1	7	78	187	240	274	298	6.6	690.9	111.8	11276	476.5	24.9140	61.3
12	14	12	85/15	C	1	7	78	187	240	274	298	6.6	669.8	106.4	11276	486.3	23.3640	61.3
25	90	6	20/80	B	1	15	78	187	240	274	298	6.8	626.2	161.8	10398	2683.7	135.2729	51.3
26	90	6	20/80	C	1	7	78	187	240	274	298	7.0	734.1	129.0	10378	2850.5	109.2229	51.3
27	90	6	60/40	B	1	7	78	187	240	274	298	6.7	723.7	130.5	10378	2031.4	103.7830	51.3
28	90	6	60/40	C	1	7	78	187	240	274	298	6.7	653.1	108.3	10378	2116.2	90.7829	51.3
29	90	6	85/15	B	1	7	78	187	240	274	298	6.5	619.0	104.9	10378	1624.2	84.0929	50.1
30	90	6	85/15	C	1	7	78	187	240	274	298	6.5	573.5	89.6	10378	1655.1	79.1729	50.0
31	90	6	20/80	B	1	7	78	187	240	274	298	6.9	1188.1	237.2	11276	5150.0	260.9099	61.3
32	90	6	20/80	C	1	7	78	187	240	274	298	7.0	1017.2	188.5	11276	5485.6	209.1900	61.3
33	90	6	60/40	B	1	7	78	187	240	274	298	6.7	984.4	180.6	11276	3847.1	198.1700	61.3
34	90	6	60/40	C	1	7	78	187	240	274	298	6.7	887.4	157.0	11276	3017.0	172.3400	61.3
35	90	6	85/15	B	1	7	78	187	240	274	298	6.6	844.5	144.5	11276	3031.4	158.8699	61.3
36	90	6	85/15	C	1	7	78	187	240	274	298	6.6	780.9	130.0	11276	3095.1	149.4600	61.3

Optimal Systems Summary by Mission

Performance Index - Weight + Volume

Constraints * - as per M-WVRR-1

TABLE V-2- 11

No.	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res.Wt. (Lbs.)	Res. Vol (C.F.)	Crew Req. Manhr/Day
	Mission																	
1	14	6	20/80	B	1	7	78	189	240	278	298	7.0	599.6	96.1	10466	420.7	23.366	31.3
2	14	6	20/80	C	1	7	78	189	240	278	298	7.2	558.3	86.9	10466	446.6	19.3460	31.3
3	14	6	60/40	B	1	7	78	189	240	278	298	6.9	552.4	85.9	10466	319.3	18.4960	31.3
4	14	6	60/40	C	1	7	78	189	240	278	298	6.9	525.9	79.6	10466	332.3	16.4560	31.3
5	14	6	85/15	B	1	7	78	189	240	278	298	6.7	516.4	77.9	10466	255.8	15.4160	31.3
6	14	6	85/15	C	1	7	78	189	240	278	298	6.7	504.9	75.3	10466	261.3	14.6610	31.3
7	14	12	20/80	B	1	7	78	189	240	278	298	7.0	822.5	140.5	11384	806.1	40.8240	44.6
8	14	12	20/80	C	1	7	78	189	240	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	240	278	298	6.9	755.2	124.7	11384	603.5	31.2240	44.6
10	14	12	60/40	C	1	7	78	189	240	278	298	6.9	713.9	115.4	11384	629.6	26.9940	44.6
11	14	12	85/15	B	1	7	78	189	240	278	298	6.8	695.9	112.3	11384	476.5	24.9140	44.6
12	14	12	85/15	C	1	7	78	189	240	278	298	6.8	674.8	106.9	11384	486.3	23.3640	44.6
25	90	6	20/80	B				N	O	N	E	-	-	-	-	-	-	-
26	90	6	20/80	C				N	O	N	E	-	-	-	-	-	-	-
27	90	6	60/40	B				N	O	N	E	-	-	-	-	-	-	-
28	90	6	60/40	C				N	O	N	E	-	-	-	-	-	-	-
29	90	6	85/15	B				N	O	N	E	-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	189	240	278	298	6.7	578.5	90.1	10468	1655.1	79.1729	33.3
31	90	6	20/80	B				N	O	N	E	-	-	-	-	-	-	-
32	90	6	20/80	C				N	O	N	E	-	-	-	-	-	-	-
33	90	6	60/40	B				N	O	N	E	-	-	-	-	-	-	-
34	90	6	60/40	C				N	O	N	E	-	-	-	-	-	-	-
35	90	6	85/15	B	1	7	78	189	240	278	298	6.8	849.5	145.0	11384	3031.4	158.8699	44.6
36	90	6	85/15	C	1	7	78	189	240	278	298	6.8	785.9	130.5	11384	3095.1	149.4600	44.6

Optimal Systems Summary by Mission

TABLE V-2-12

Performance Index - Weight

Constraints * - None

No.	Mission Resupply (Days)	Mission Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res.Wt. (Lbs.)	Res. Vol (C.F.)	Crew Req. Manhr/Day
1	14	6	20/80	B	1	7	78	187	240	274	298	6.8	594.6	95.6	10376	420.7	23.366	48.0
2	14	6	20/80	C	1	7	78	187	240	274	298	7.0	553.3	86.4	10376	446.6	19.3460	48.0
3	14	6	60/40	B	1	7	78	187	240	274	298	6.7	547.4	85.4	10376	319.3	18.4960	48.0
4	14	6	60/40	C	1	7	78	187	240	274	298	6.7	520.9	79.1	10376	332.3	16.4560	48.0
5	14	6	85/15	B	1	7	78	187	240	274	298	6.6	511.4	77.4	10376	255.8	15.4160	48.0
6	14	6	85/15	C	1	7	78	187	240	274	298	6.6	499.9	74.8	10376	261.3	14.6610	48.0
7	14	12	20/80	B	1	7	78	187	240	274	298	6.9	817.5	140.0	11276	806.1	40.8240	61.3
8	14	12	20/80	C	1	7	78	187	240	274	298	7.0	752.3	124.8	11276	858.3	32.7240	61.3
9	14	12	60/40	B	1	7	78	187	240	274	298	6.7	750.2	124.2	11276	603.5	31.2240	61.3
10	14	12	60/40	C	1	7	78	187	240	274	298	6.7	708.9	114.9	11276	629.6	26.9940	61.3
11	14	12	85/15	B	1	7	78	187	240	274	298	6.6	690.9	111.8	11276	476.5	24.9140	61.3
12	14	12	85/15	C	1	7	78	187	240	274	298	6.6	669.8	106.4	11276	486.3	23.3640	61.3
25	90	6	20/80	B	1	7	78	187	240	274	298	6.8	626.2	161.8	10398	2683.7	135.2729	51.3
26	90	6	20/80	C	1	7	78	187	240	274	298	7.0	734.1	129.0	10378	2850.5	109.2229	51.3
27	90	6	60/40	B	1	7	78	187	240	274	298	6.7	723.7	130.5	10378	2031.4	103.7830	51.3
28	90	6	60/40	C	1	7	78	187	240	274	298	6.7	653.1	108.3	10378	2116.2	90.7829	51.3
29	90	6	85/15	B	1	7	78	187	240	274	298	6.5	619.0	104.9	10378	1624.2	84.0929	50.1
30	90	6	85/15	C	1	7	78	187	240	274	298	6.5	573.5	89.6	10378	1655.1	79.1729	50.0
31	90	6	20/80	B	1	7	78	187	240	274	298	6.9	1188.1	237.2	11276	5150.0	260.9099	61.3
32	90	6	20/80	C	1	7	78	187	240	274	298	7.0	1017.2	188.5	11276	5485.6	209.1900	61.3
33	90	6	60/40	B	1	7	78	187	240	274	298	6.7	984.4	180.6	11276	3847.1	198.1700	61.3
34	90	6	60/40	C	1	7	78	187	240	274	298	6.7	887.4	157.0	11276	4017.0	172.3400	61.3
35	90	6	85/15	B	1	7	78	187	240	274	298	6.6	844.5	144.5	11276	3031.4	158.8699	61.3
36	90	6	85/15	C	1	7	78	187	240	274	298	6.6	780.9	130.0	11276	3095.1	149.4600	61.3

Optimal Systems Summary by Mission

TABLE V-2-13

Performance Index - Weight

Constraints * - Basic

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C.F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	7	78	189	240	278	298	7.0	599.6	96.1	10466	420.7	23.366	31.3
2	14	6	20/80	C	1	7	78	189	240	278	298	7.2	558.3	86.9	10466	446.6	19.3460	31.3
3	14	6	60/40	B	1	7	78	189	240	278	298	6.9	552.4	85.9	10466	319.3	18.4960	31.3
4	14	6	60/40	C	1	7	78	189	240	278	298	6.9	525.9	79.6	10466	332.3	16.4560	31.3
5	14	6	85/15	B	1	7	78	189	240	278	298	6.7	516.4	77.9	10466	255.8	15.4160	31.3
6	14	6	85/15	C	1	7	78	189	240	278	298	6.7	504.9	75.3	10466	261.3	14.6610	31.3
7	14	12	20/80	B	1	7	78	189	240	278	298	7.0	822.5	140.5	11384	806.1	40.8240	44.6
8	14	12	20/80	C	1	7	78	189	244	278	298	7.1	759.1	125.4	11439	849.2	31.2240	42.6
9	14	12	60/40	B	1	7	78	189	240	278	298	6.9	755.2	124.7	11384	603.5	31.2240	44.6
10	14	12	60/40	C	1	7	78	189	240	278	298	6.9	713.9	115.4	11384	629.6	26.9940	44.6
11	14	12	85/15	B	1	7	78	189	240	278	298	6.8	695.9	112.3	11384	476.5	24.9140	44.6
12	14	12	85/15	C	1	7	78	189	240	278	298	6.8	674.8	106.9	11384	486.3	23.3640	44.6
25	90	6	20/80	B			N	O	N	E		-	-	-	-	-	-	-
26	90	6	20/80	C			N	O	N	E		-	-	-	-	-	-	-
27	90	6	60/40	B			N	O	N	E		-	-	-	-	-	-	-
28	90	6	60/40	C			N	O	N	E		-	-	-	-	-	-	-
29	90	6	85/15	B			N	O	N	E		-	-	-	-	-	-	-
30	90	6	85/15	C	1	7	78	189	240	278	298	6.7	578.5	90.1	10468	1655.1	79.1729	33.3
31	90	6	20/80	B			N	O	N	E		-	-	-	-	-	-	-
32	90	6	20/80	C			N	O	N	E		-	-	-	-	-	-	-
33	90	6	60/40	B			N	O	N	E		-	-	-	-	-	-	-
34	90	6	60/40	C			N	O	N	E		-	-	-	-	-	-	-
35	90	6	85/15	B	1	7	78	189	240	278	298	6.8	849.5	145.0	11384	3031.4	158.8699	44.6
36	90	6	85/15	C	1	7	78	189	240	278	298	6.8	785.9	130.5	11384	3095.1	149.4600	44.6

Optimal Systems Summary by Mission

TABLE V-2-14

Performance Index - Cost

Constraints * - None

No.	Mission Resupply Days	Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
1	14	6	20/80	B	1	5	158	187	240	274	298	6.9	636.5	98.6	10346	420.7	23.366	49.5
2	14	6	20/80	C	1	5	158	187	240	274	298	7.0	592.0	89.1	10346	446.7	19.3460	49.5
3	14	6	60/40	B	1	5	158	187	240	274	298	6.7	587.3	88.0	10346	319.4	18.4910	49.5
4	14	6	60/40	C	1	5	158	187	240	274	298	6.7	554.5	81.7	10346	332.4	16.4860	49.5
5	14	6	85/15	B	1	5	158	187	240	274	298	6.6	545.0	80.0	10346	255.9	15.4460	49.5
6	14	6	85/15	C	1	5	158	187	240	274	298	6.6	533.7	77.4	10346	261.4	14.6760	49.5
7	14	12	20/80	B	1	5	183	187	240	274	298	6.9	1043.5	305.1	11121	806.6	40.8440	59.8
8	14	12	20/80	C	1	5	183	187	240	274	298	7.0	972.4	289.8	11121	858.8	32.7740	59.8
9	14	12	60/40	B	1	5	183	187	240	274	298	6.7	971.4	289.3	11121	604.0	31.2640	59.8
10	14	12	60/40	C	1	5	183	187	240	274	298	6.7	926.9	279.9	11121	630.2	27.0340	59.8
11	14	12	85/15	B	1	5	183	187	240	274	298	6.6	908.9	276.7	11121	477.1	24.9540	59.8
12	14	12	85/15	C	1	5	183	187	240	274	298	6.6	884.9	271.3	11121	486.9	23.4190	59.8
25	90	6	20/80	B	1	5	158	187	240	274	298	6.8	885.8	155.2	10348	2682.6	135.0629	52.8
26	90	6	20/80	C	1	5	158	187	240	274	298	7.0	782.4	130.0	10348	2850.3	109.2029	52.8
27	90	6	60/40	B	1	5	158	187	240	274	298	6.7	773.6	133.5	10348	2031.3	103.7630	52.8
28	90	6	60/40	C	1	5	158	187	240	274	298	6.7	696.7	111.1	10348	2116.2	90.8129	52.8
29	90	6	85/15	B	1	5	158	187	240	274	298	6.6	661.8	107.7	10348	1642.2	84.0929	51.6
30	90	6	85/15	C	1	5	158	187	240	274	298	6.6	613.4	92.3	10348	1655.1	79.1679	51.5
31	90	6	20/80	B	1	5	183	187	240	274	298	6.9	1425.7	402.5	11121	5150.4	260.9299	59.8
32	90	6	20/80	C	1	5	183	187	240	274	298	7.0	1250.1	353.8	11121	5486.1	209.2099	59.8
33	90	6	60/40	B	1	5	183	187	240	274	298	6.7	1217.8	345.4	11121	3848.1	198.1899	59.8
34	90	6	60/40	C	1	5	183	187	240	274	298	6.7	1115.0	322.2	11121	4017.8	172.3599	59.8
35	90	6	85/15	B	1	5	183	187	240	274	298	6.6	1071.0	309.7	11121	3031.7	158.9200	59.8
36	90	6	85/15	C	1	5	183	187	240	274	298	6.6	1002.1	295.1	11121	3095.7	149.5000	59.8

Optimal Systems Summary by Mission

Performance Index - Cost

Constraints * - As per M-WVRR-1

TABLE V-2-15

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1							NO		SYSTEMS			MEETING		CONSTRAINTS				
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
25																		
26																		
27																		
28																		
29																		
30																		
31																		
32																		
33																		
34																		
35																		
36																		

Optimal Systems Summary by Mission

TABLE V-2-16

Performance Index - Volume

Constraints * - None

No.	Mission				Optimal System (Subsystems by Function)							Crew Acc.	Weight (Lbs)	Volume (C. F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C. F.)	Crew Req. Manhr/Day
	Mission Resupply (Days)	Crew (Men)	H_2O Bal.	Food Mix	1	2	3	4	5	6	7							
1	14	6	20/80	B	1	5	46	187	240	274	298	6.9	629.3	92.9	10356	420.4	23.3289	48.0
2	14	6	20/80	C	1	5	46	187	240	274	298	7.0	584.8	83.5	10356	446.3	19.3090	48.0
3	14	6	60/40	B	1	5	46	187	240	274	298	6.7	580.1	82.4	10356	319.0	18.4540	48.0
4	14	6	60/40	C	1	5	46	187	240	274	298	6.7	547.3	76.0	10356	332.1	16.4490	48.0
5	14	6	85/15	B	1	5	46	187	240	274	298	6.6	537.8	74.4	10356	255.6	15.4090	48.0
6	14	6	85/15	C	1	5	46	187	240	274	298	6.6	526.5	71.8	10356	261.0	14.6390	48.0
7	14	12	20/80	B	1	5	46	187	240	274	298	6.9	863.1	135.0	11256	806.0	40.7600	61.4
8	14	12	20/80	C	1	5	46	187	240	274	298	7.0	792.0	119.7	11256	858.2	32.6899	61.4
9	14	12	60/40	B	1	5	46	187	240	274	298	6.7	791.0	119.2	11256	603.4	31.1799	61.4
10	14	12	60/40	C	1	9	46	187	240	274	298	6.6	851.9	102.0	11286	633.4	28.1299	61.4
11	14	12	85/15	B	1	5	46	187	240	274	298	6.6	728.5	106.6	11256	476.4	24.8699	61.4
12	14	12	85/15	C	1	5	46	187	240	274	298	6.6	704.5	101.2	11256	486.2	23.3350	61.4
25	90	6	20/80	B	1	5	46	187	240	274	298	6.8	878.6	149.5	10358	2682.3	135.0259	51.4
26	90	6	20/80	C	1	5	46	187	240	274	298	7.0	775.2	126.3	10358	2850.0	109.1659	51.4
27	90	6	60/40	B	1	5	46	187	240	274	298	6.7	766.4	127.8	10358	2031.0	103.7260	51.4
28	90	6	60/40	C	1	5	46	187	240	274	298	6.7	689.5	105.5	10358	2115.9	90.7759	51.4
29	90	6	60/40	B	1	13	46	187	240	274	298	6.6	719.8	101.7	10378	1624.5	84.1059	50.2
30	90	6	60/40	C	1	5	46	187	240	274	298	6.6	606.2	86.7	10358	1654.8	79.1309	50.0
31	90	6	20/80	B	1	5	46	187	240	274	298	6.9	1245.3	232.4	11256	5149.7	260.8459	61.4
32	90	6	20/80	C	1	5	46	187	240	274	298	7.0	1069.7	183.7	11256	5485.5	209.1259	61.4
33	90	6	60/40	B	1	5	46	187	240	274	298	6.7	1037.4	175.3	11256	3847.5	198.1059	61.4
34	90	6	60/40	C	1	5	46	187	240	274	298	6.7	934.6	152.1	11256	4017.2	172.2759	61.4
35	90	6	85/15	B	1	5	46	187	240	274	298	6.6	890.6	139.6	11256	3031.1	158.8360	61.4
36	90	6	85/15	C	1	5	46	187	240	274	298	6.6	821.7	125.0	11256	3095.1	149.4160	61.4

Optimal Systems Summary by Mission

Performance Index - Volume

Constraints * - As per Tables M-WVRR-1

TABLE V-2-17

No.	Mission Resupply (Days)	Mission Crew (Men)	H_2O Bal.	Food Mix	Optimal System (Subsystems by Function) 1	2	3	4	5	6	7	Crew Acc.	Weight (Lbs)	Volume (C.F.)	Cost (KDOL)	Res. Wt. (Lbs.)	Res. Vol (C.F.)	Crew Req. Manhr/Day
1	14	6	20/80	B	1	5	46	189	240	278	298	7.1	634.3	93.4	10446	420.4	23.3289	31.4
2	14	6	20/80	C	1	5	46	189	240	278	298	7.2	589.8	84.0	10446	446.3	19.3090	31.4
3	14	6	60/40	B	1	5	46	189	240	278	298	6.9	585.1	82.9	10446	319.0	18.4540	31.4
4	14	6	60/40	C	1	5	46	189	240	278	298	6.9	552.3	76.5	10.446	332.1	16.4490	31.4
5	14	6	85/15	B	1	5	46	189	240	278	298	6.8	542.8	74.9	10446	255.6	15.4090	31.4
6	14	6	85/15	C	1	5	142	187	247	274	298	6.5	528.5	71.8	10372	260.2	12.3760	46.0
7	14	12	20/80	B	1	7	46	189	240	278	298	7.1	842.5	136.4	11379	806.1	40.8100	44.7
8	14	12	20/80	C	1	5	46	189	240	278	298	7.2	799.7	120.3	11379	849.1	31.1899	44.7
9	14	12	60/40	B	1	5	46	189	240	278	298	6.9	796.0	119.7	11364	603.4	31.1799	44.7
10	14	12	60/40	C		N	O	N	E			-	-	-	-	-	-	-
11	14	12	85/15	B	1	5	46	189	240	278	298	6.8	733.5	107.1	11364	476.4	24.8699	44.7
12	14	12	85/15	C	1	5	46	189	240	278	298	6.8	709.5	101.7	11364	486.2	23.3350	44.7
25	90	6	20/80	B		N	O	N	E			-	-	-	-	-	-	-
26	90	6	20/80	C		N	O	N	E			-	-	-	-	-	-	-
27	90	6	60/40	B		N	O	N	E			-	-	-	-	-	-	-
28	90	6	60/40	C		N	O	N	E			-	-	-	-	-	-	-
29	90	6	85/15	B		N	O	N	E			-	-	-	-	-	-	-
30	90	6	85/15	C	1	5	46	189	240	278	298	6.7	611.2	87.2	10448	1654.8	79.1309	33.4
31	90	6	20/80	B		N	O	N	E			-	-	-	-	-	-	-
32	90	6	20/80	C		N	O	N	E			-	-	-	-	-	-	-
33	90	6	60/40	B		N	O	N	E			-	-	-	-	-	-	-
34	90	6	60/40	C		N	O	N	E			-	-	-	-	-	-	-
35	90	6	85/15	B	1	5	46	189	240	278	298	6.8	895.6	140.1	11364	3031.1	158.8360	44.7
36	90	6	85/15	C	1	5	46	189	240	278	298	6.8	826.7	125.5	11364	3095.1	149.4160	44.7

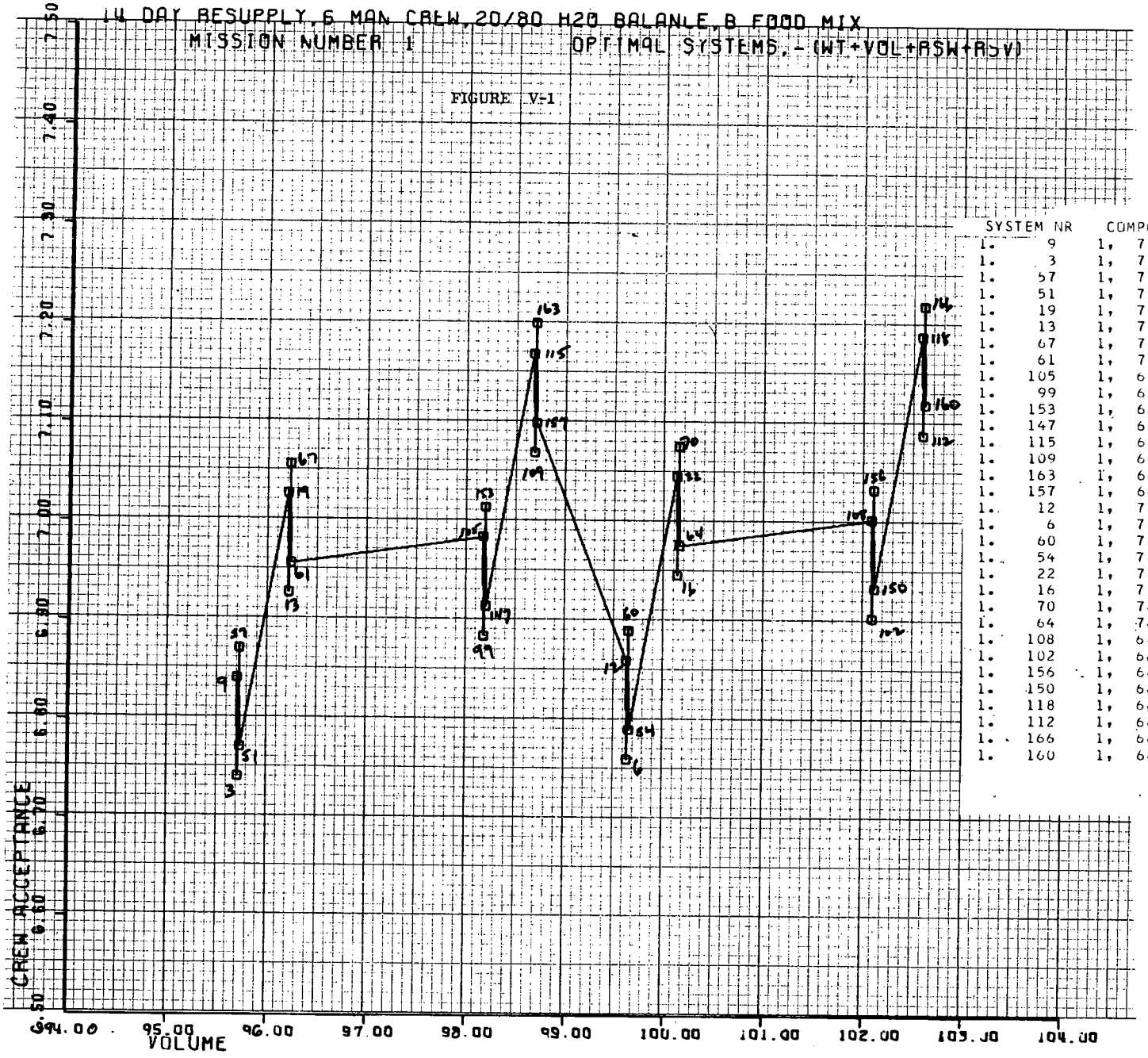


FIGURE V-1

	SYSTEM NR	COMPOSITION
1.	9	1, 7, 78,187,238,274,298
1.	3	1, 7, 78,187,244,274,298
1.	57	1, 7, 79,187,238,274,298
1.	51	1, 7, 79,187,244,274,298
1.	19	1, 7, 78,189,238,278,298
1.	13	1, 7, 78,189,244,278,298
1.	67	1, 7, 79,189,238,278,298
1.	61	1, 7, 79,189,244,278,298
1.	105	1, 6, 78,187,238,274,298
1.	99	1, 6, 78,187,244,274,298
1.	153	1, 6, 79,187,238,274,298
1.	147	1, 6, 79,187,244,274,298
1.	115	1, 6, 78,189,238,278,298
1.	109	1, 6, 78,189,244,278,298
1.	163	1, 6, 79,189,238,278,298
1.	157	1, 6, 79,189,244,278,298
1.	12	1, 7, 78,187,238,275,298
1.	6	1, 7, 78,187,244,275,298
1.	60	1, 7, 79,187,238,275,298
1.	54	1, 7, 79,187,244,275,298
1.	22	1, 7, 78,189,238,279,298
1.	16	1, 7, 78,189,244,279,298
1.	70	1, 7, 79,189,238,279,298
1.	64	1, 7, 79,189,244,279,298
1.	108	1, 6, 78,187,238,275,298
1.	102	1, 6, 78,187,244,275,298
1.	156	1, 6, 79,187,238,275,298
1.	150	1, 6, 79,187,244,275,298
1.	118	1, 6, 78,189,238,279,298
1.	112	1, 6, 78,189,244,279,298
1.	166	1, 6, 79,189,238,279,298
1.	160	1, 6, 79,189,244,279,298

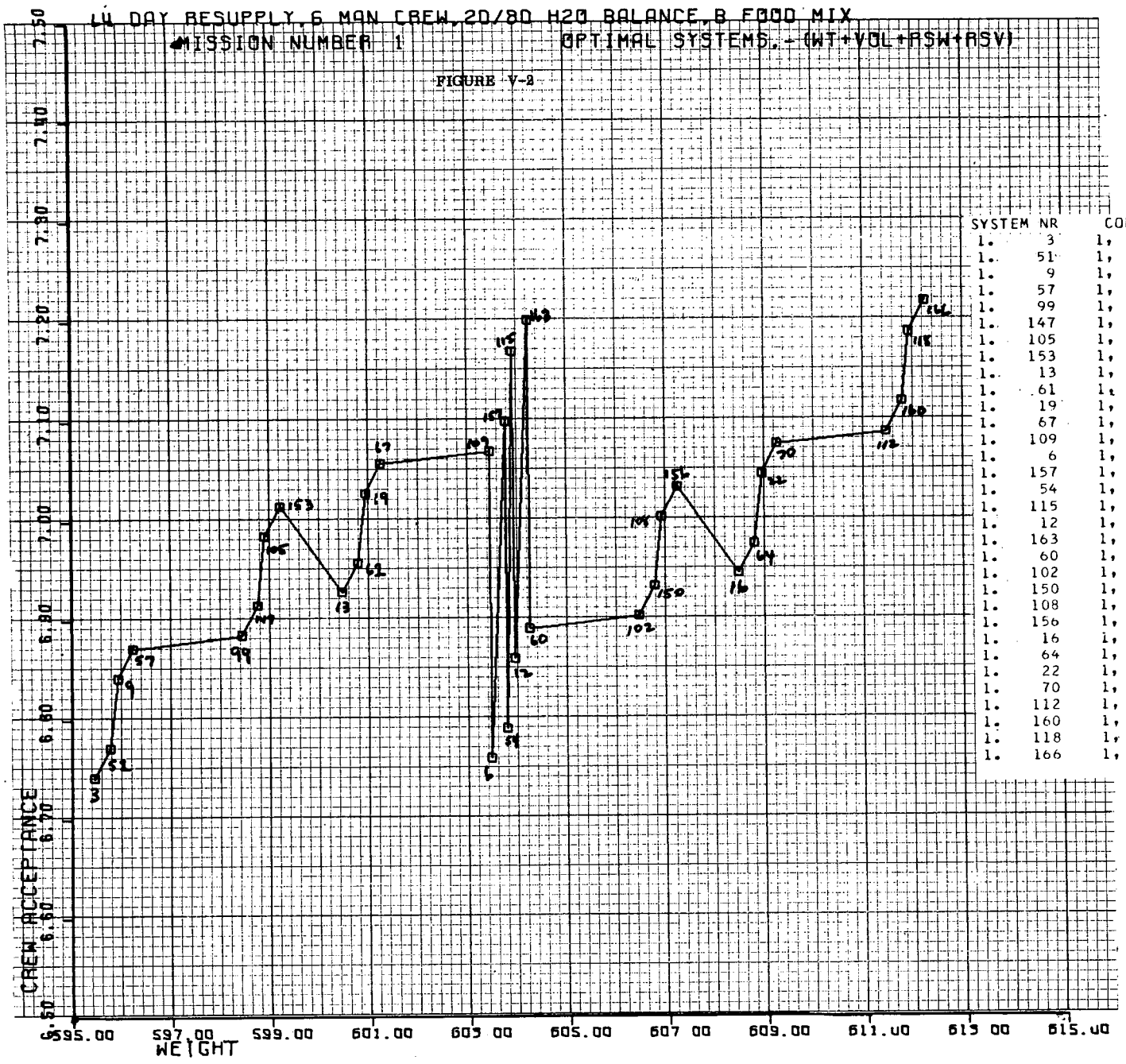


FIGURE V-2

SYSTEM NR		COMPOSITION
1.	3	1, 7, 78,187,244,274,298
1.	51	1, 7, 79,187,244,274,298
1.	9	1, 7, 78,187,238,274,298
1.	57	1, 7, 79,187,238,274,298
1.	99	1, 6, 78,187,244,274,298
1.	147	1, 6, 79,187,244,274,298
1.	105	1, 6, 78,187,238,274,298
1.	153	1, 6, 79,187,238,274,298
1.	13	1, 7, 78,189,244,278,298
1.	61	1, 7, 79,189,244,278,298
1.	19	1, 7, 78,189,238,278,298
1.	67	1, 7, 79,189,238,278,298
1.	109	1, 6, 78,189,244,278,298
1.	6	1, 7, 78,187,244,275,298
1.	157	1, 6, 79,189,244,278,298
1.	54	1, 7, 79,187,244,275,298
1.	115	1, 6, 78,189,238,278,298
1.	12	1, 7, 78,187,238,275,298
1.	163	1, 6, 79,189,238,278,298
1.	60	1, 7, 79,187,238,275,298
1.	102	1, 6, 78,187,244,275,298
1.	150	1, 6, 79,187,244,275,298
1.	108	1, 6, 78,187,238,275,298
1.	156	1, 6, 79,187,238,275,298
1.	16	1, 7, 78,189,244,279,298
1.	64	1, 7, 79,189,244,279,298
1.	22	1, 7, 78,189,238,279,298
1.	70	1, 7, 79,189,238,279,298
1.	112	1, 6, 78,189,244,279,298
1.	160	1, 6, 79,189,244,279,298
1.	118	1, 6, 78,189,238,279,298
1.	166	1, 6, 79,189,238,279,298

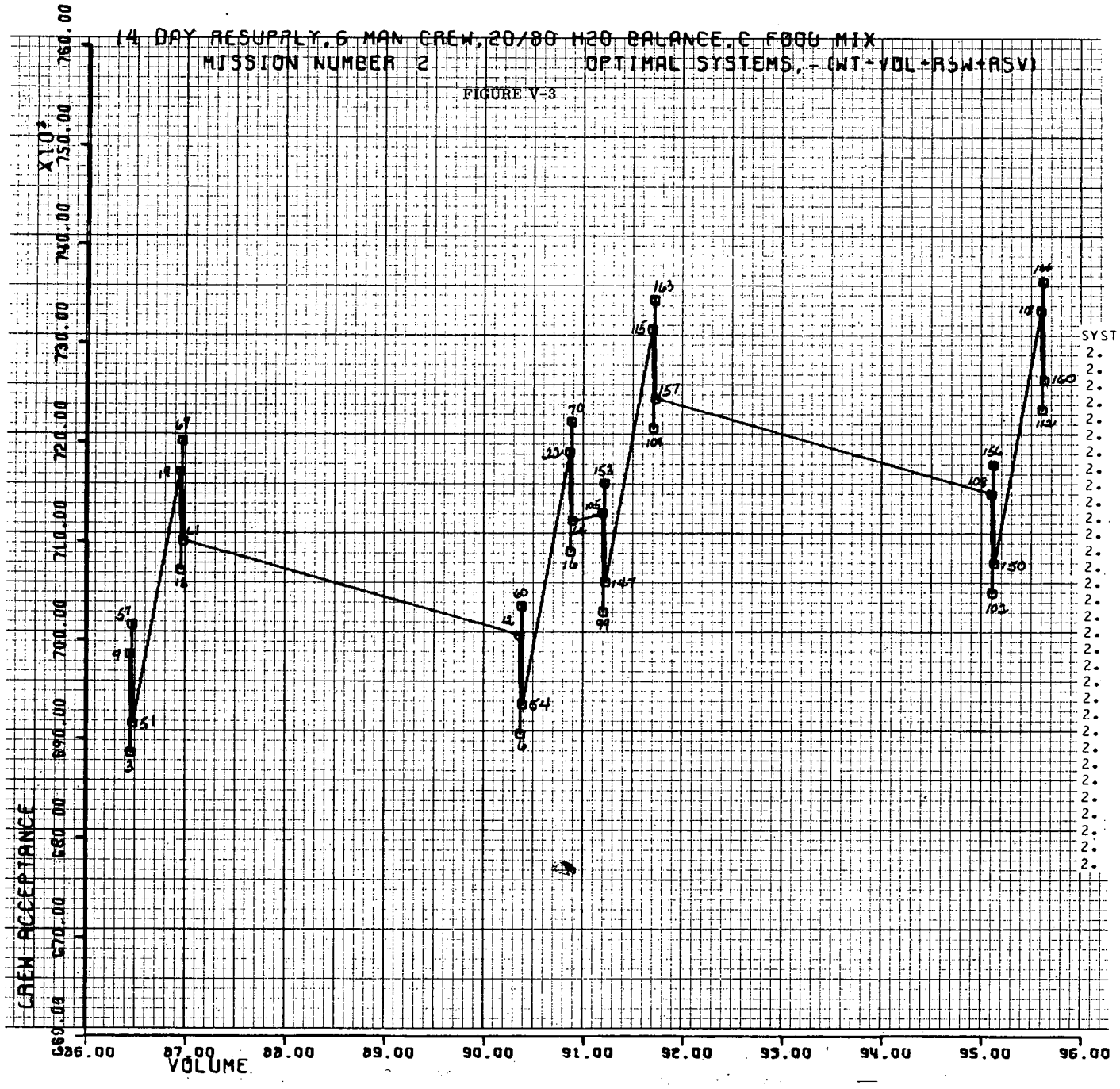


FIGURE V-3

SYSTEM NR		COMPOSITION
2.	9	1, 7, 78,187,238,274,298
2.	3	1, 7, 78,187,244,274,298
2.	57	1, 7, 79,187,238,274,298
2.	51	1, 7, 79,187,244,274,298
2.	19	1, 7, 78,189,238,278,298
2.	13	1, 7, 78,189,244,278,298
2.	67	1, 7, 79,189,238,278,298
2.	61	1, 7, 79,189,244,278,298
2.	12	1, 7, 78,187,238,275,298
2.	6	1, 7, 78,187,244,275,298
2.	60	1, 7, 79,187,238,275,298
2.	54	1, 7, 79,187,244,275,298
2.	22	1, 7, 78,189,238,279,298
2.	16	1, 7, 78,189,244,279,298
2.	70	1, 7, 79,189,238,279,298
2.	64	1, 7, 79,189,244,279,298
2.	105	1, 6, 78,187,238,274,298
2.	99	1, 6, 78,187,244,274,298
2.	153	1, 6, 79,187,238,274,298
2.	147	1, 6, 79,187,244,274,298
2.	115	1, 6, 78,189,238,278,298
2.	109	1, 6, 78,189,244,278,298
2.	163	1, 6, 79,189,238,278,298
2.	157	1, 6, 79,189,244,278,298
2.	108	1, 6, 78,187,238,275,298
2.	102	1, 6, 78,187,244,275,298
2.	156	1, 6, 79,187,238,275,298
2.	150	1, 6, 79,187,244,275,298
2.	118	1, 6, 78,189,238,279,298
2.	112	1, 6, 78,189,244,279,298
2.	166	1, 6, 79,189,238,279,298
2.	160	1, 6, 79,189,244,279,298

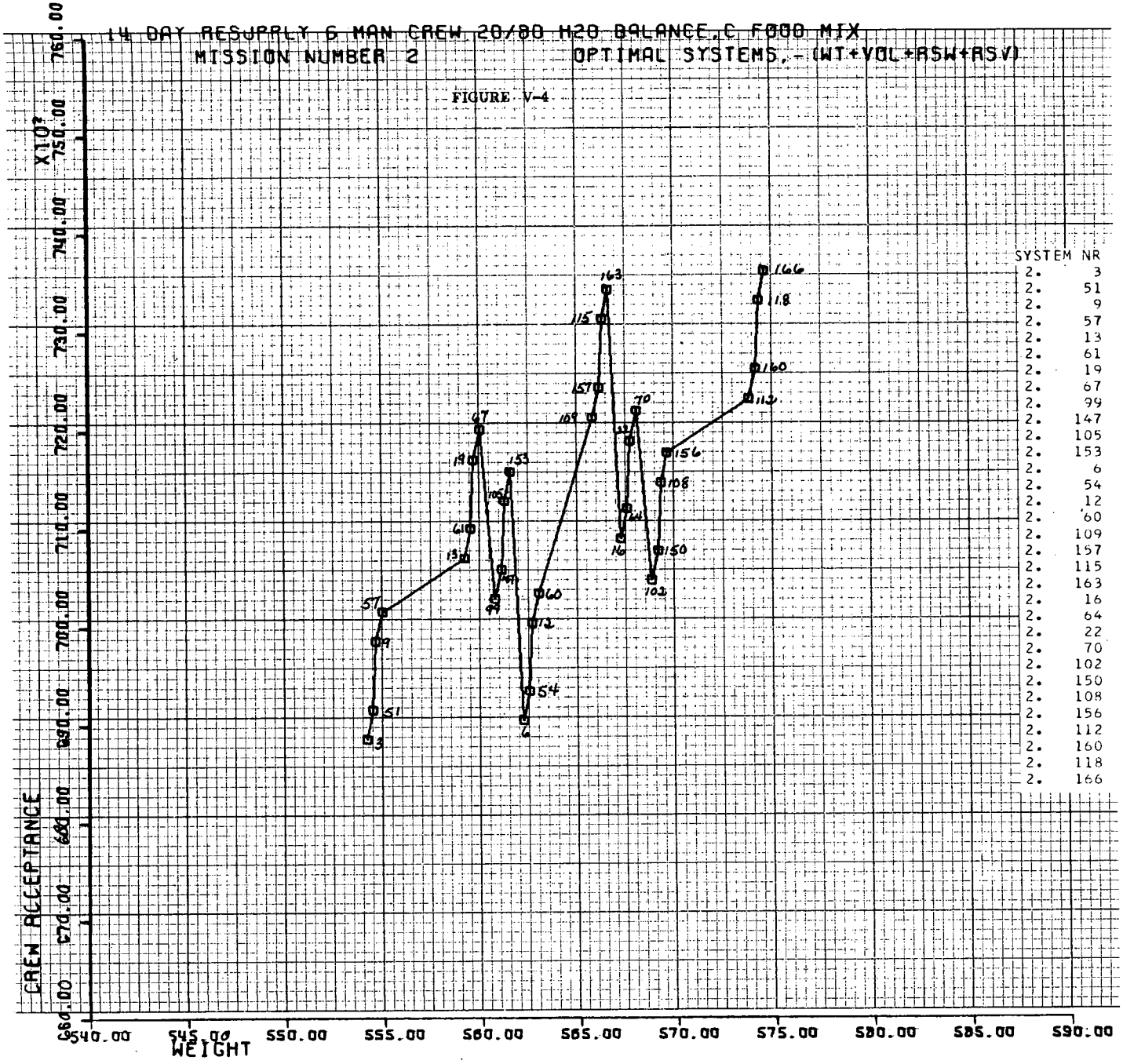
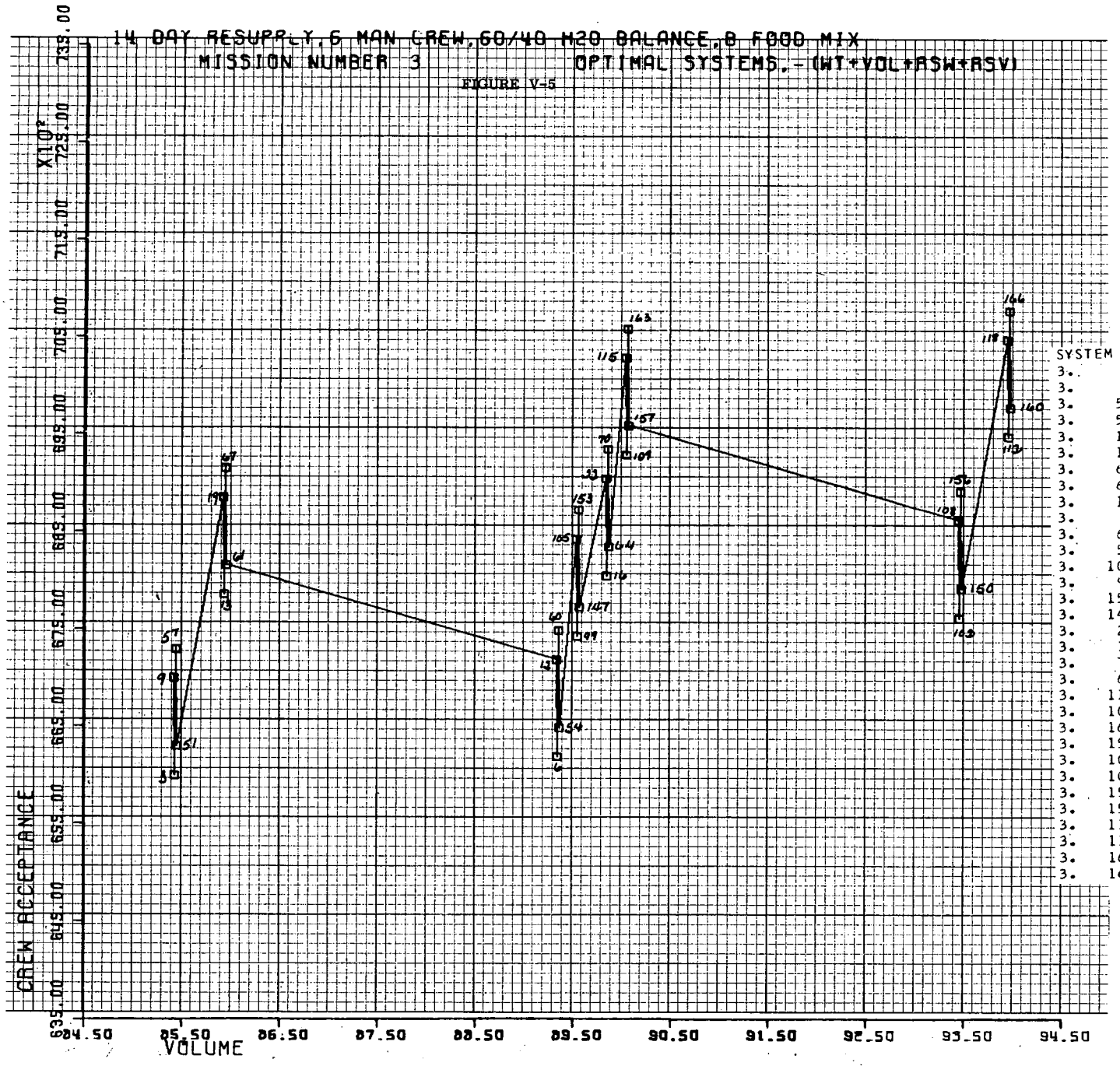


FIGURE V-4

SYSTEM NR		COMPOSITION
2.	3	1, 7, 78,187,244,274,298
2.	51	1, 7, 79,187,244,274,298
2.	9	1, 7, 78,187,238,274,298
2.	57	1, 7, 79,187,238,274,298
2.	13	1, 7, 78,189,244,278,298
2.	61	1, 7, 79,189,244,278,298
2.	19	1, 7, 78,189,238,278,298
2.	67	1, 7, 79,189,238,278,298
2.	99	1, 6, 78,187,244,274,298
2.	147	1, 6, 79,187,244,274,298
2.	105	1, 6, 78,187,238,274,298
2.	153	1, 6, 79,187,238,274,298
2.	6	1, 7, 78,187,244,275,298
2.	54	1, 7, 79,187,244,275,298
2.	12	1, 7, 78,187,238,275,298
2.	60	1, 7, 79,187,238,275,298
2.	109	1, 6, 78,189,244,278,298
2.	157	1, 6, 79,189,244,278,298
2.	115	1, 6, 78,189,238,278,298
2.	163	1, 6, 79,189,238,278,298
2.	16	1, 7, 78,189,244,279,298
2.	64	1, 7, 79,189,244,279,298
2.	22	1, 7, 78,189,238,279,298
2.	70	1, 7, 79,189,238,279,298
2.	102	1, 6, 78,187,244,275,298
2.	150	1, 6, 79,187,244,275,298
2.	108	1, 6, 78,187,238,275,298
2.	156	1, 6, 79,187,238,275,298
2.	112	1, 6, 78,189,244,279,298
2.	160	1, 6, 79,189,244,279,298
2.	118	1, 6, 78,189,238,279,298
2.	166	1, 6, 79,189,238,279,298



SYSTEM NR		COMPOSITION
3.	9	1, 7, 78,187,238,274,298
3.	3	1, 7, 78,187,244,274,298
3.	57	1, 7, 79,187,238,274,298
3.	51	1, 7, 79,187,244,274,298
3.	19	1, 7, 78,189,238,278,298
3.	13	1, 7, 78,189,244,278,298
3.	67	1, 7, 79,189,238,278,298
3.	61	1, 7, 79,189,244,278,298
3.	12	1, 7, 78,187,238,275,298
3.	6	1, 7, 78,187,244,275,298
3.	60	1, 7, 79,187,238,275,298
3.	54	1, 7, 79,187,244,275,298
3.	105	1, 6, 78,187,238,274,298
3.	99	1, 6, 78,187,244,274,298
3.	153	1, 6, 79,187,238,274,298
3.	147	1, 6, 79,187,244,274,298
3.	22	1, 7, 78,189,238,279,298
3.	16	1, 7, 78,189,244,279,298
3.	70	1, 7, 79,189,238,279,298
3.	64	1, 7, 79,189,244,279,298
3.	115	1, 6, 78,189,238,278,298
3.	109	1, 6, 78,189,244,278,298
3.	163	1, 6, 79,189,238,278,298
3.	157	1, 6, 79,189,244,278,298
3.	108	1, 6, 78,187,238,275,298
3.	102	1, 6, 78,187,244,275,298
3.	156	1, 6, 79,187,238,275,298
3.	150	1, 6, 79,187,244,275,298
3.	118	1, 6, 78,189,238,279,298
3.	112	1, 6, 78,189,244,279,298
3.	166	1, 6, 79,189,238,279,298
3.	160	1, 6, 79,189,244,279,298

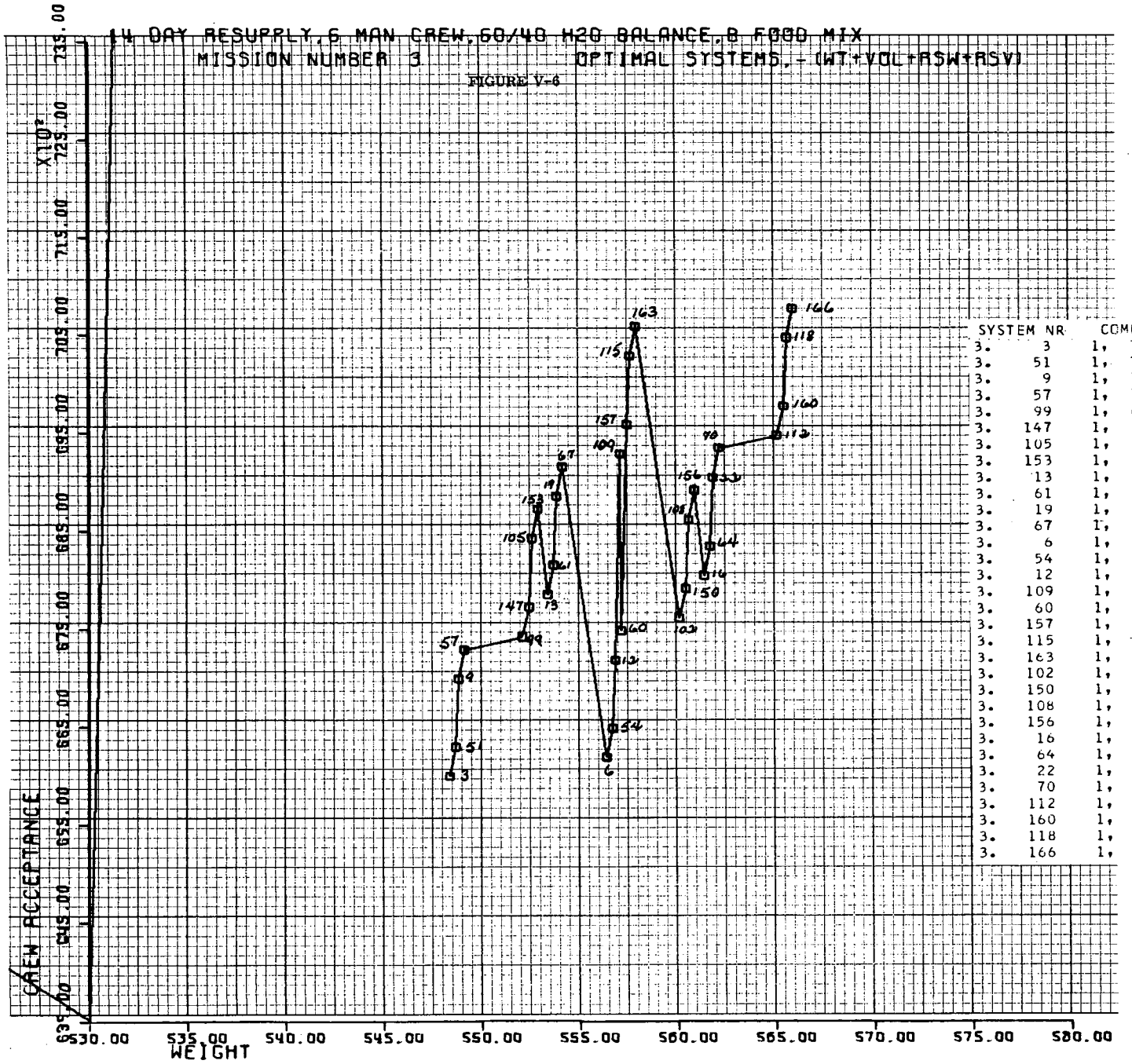


FIGURE V-6

	SYSTEM NR	COMPOSITION
3.	3	1, 7, 78,187,244,274,298
3.	51	1, 7, 79,187,244,274,298
3.	9	1, 7, 78,187,238,274,298
3.	57	1, 7, 79,187,238,274,298
3.	99	1, 6, 78,187,244,274,298
3.	147	1, 6, 79,187,244,274,298
3.	105	1, 6, 78,187,238,274,298
3.	153	1, 6, 79,187,238,274,298
3.	13	1, 7, 78,189,244,278,298
3.	61	1, 7, 79,189,244,278,298
3.	19	1, 7, 78,189,238,278,298
3.	67	1, 7, 79,189,238,278,298
3.	6	1, 7, 78,187,244,275,298
3.	54	1, 7, 79,187,244,275,298
3.	12	1, 7, 78,187,238,275,298
3.	109	1, 6, 78,189,244,278,298
3.	60	1, 7, 79,187,238,275,298
3.	157	1, 6, 79,189,244,278,298
3.	115	1, 6, 78,189,238,278,298
3.	163	1, 6, 79,189,238,278,298
3.	102	1, 6, 78,187,244,275,298
3.	150	1, 6, 79,187,244,275,298
3.	108	1, 6, 78,187,238,275,298
3.	156	1, 6, 79,187,238,275,298
3.	16	1, 7, 78,189,244,279,298
3.	64	1, 7, 79,189,244,279,298
3.	22	1, 7, 78,189,238,279,298
3.	70	1, 7, 79,189,238,279,298
3.	112	1, 6, 78,189,244,279,298
3.	160	1, 6, 79,189,244,279,298
3.	118	1, 6, 78,189,238,279,298
3.	166	1, 6, 79,189,238,279,298

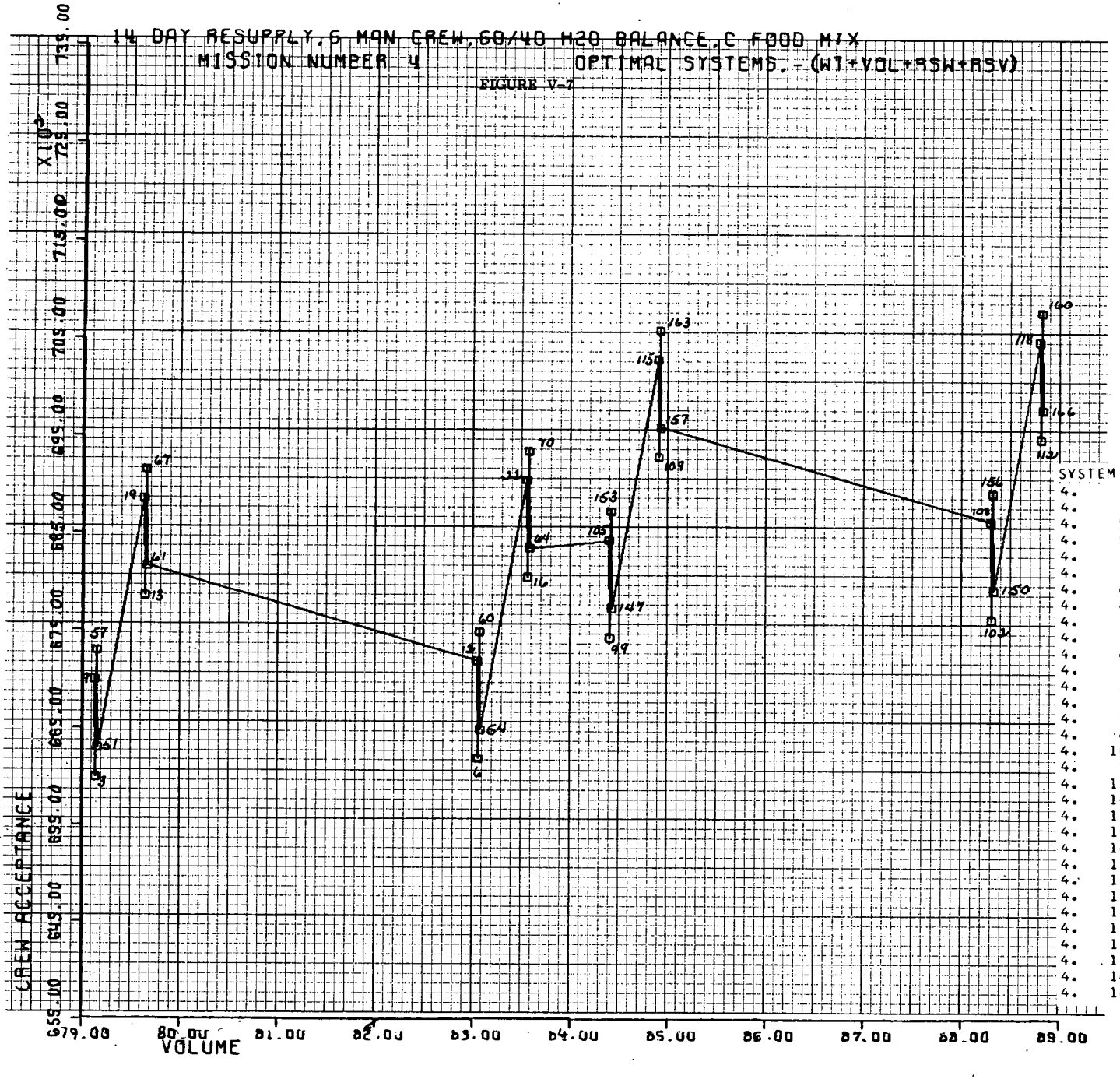


FIGURE V-7

SYSTEM NR		COMPOSITION
4.	9	1, 7, 78,187,238,274,298
4.	3	1, 7, 78,187,244,274,298
4.	57	1, 7, 79,187,238,274,298
4.	51	1, 7, 79,187,244,274,298
4.	19	1, 7, 78,189,238,278,298
4.	13	1, 7, 78,189,244,278,298
4.	67	1, 7, 79,189,238,278,298
4.	61	1, 7, 79,189,244,278,298
4.	12	1, 7, 78,187,238,275,298
4.	6	1, 7, 78,187,244,275,298
4.	60	1, 7, 79,187,238,275,298
4.	54	1, 7, 79,187,244,275,298
4.	22	1, 7, 78,189,238,279,298
4.	16	1, 7, 78,189,244,279,298
4.	70	1, 7, 79,189,238,279,298
4.	64	1, 7, 79,189,244,279,298
4.	105	1, 6, 78,187,238,274,298
4.	99	1, 6, 78,187,244,274,298
4.	153	1, 6, 79,187,238,274,298
4.	147	1, 6, 79,187,244,274,298
4.	115	1, 6, 78,189,238,278,298
4.	109	1, 6, 78,189,244,278,298
4.	163	1, 6, 79,189,238,278,298
4.	157	1, 6, 79,189,244,278,298
4.	108	1, 6, 78,187,238,275,298
4.	102	1, 6, 78,187,244,275,298
4.	156	1, 6, 79,187,238,275,298
4.	150	1, 6, 79,187,244,275,298
4.	118	1, 6, 78,189,238,279,298
4.	112	1, 6, 78,189,244,279,298
4.	166	1, 6, 79,189,238,279,298
4.	160	1, 6, 79,189,244,279,298

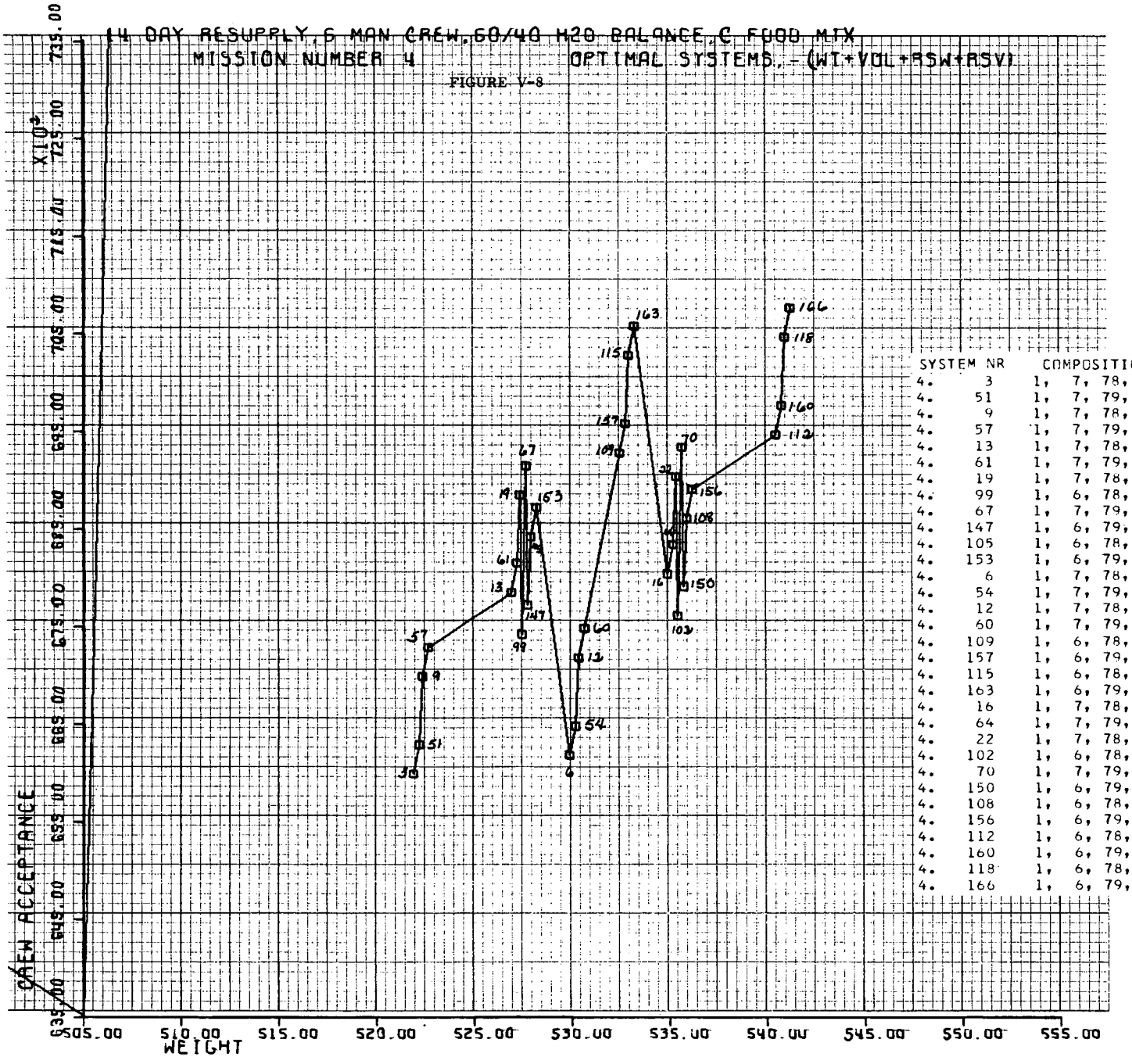
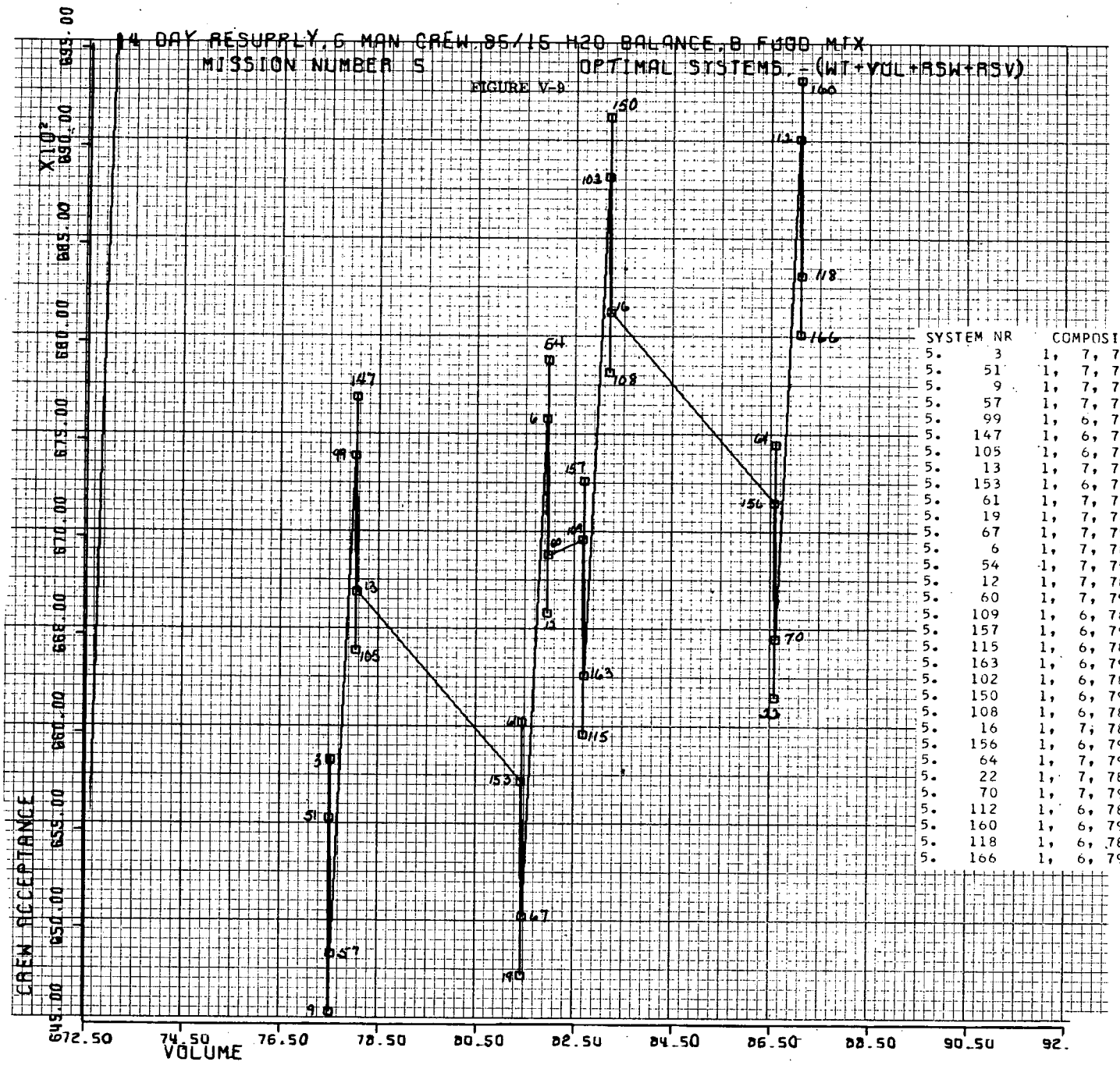


FIGURE V-8

SYSTEM NR		COMPOSITION
4.	3	1, 7, 78,187,244,274,298
4.	51	1, 7, 79,187,244,274,298
4.	9	1, 7, 78,187,238,274,298
4.	57	1, 7, 79,187,238,274,298
4.	13	1, 7, 78,189,244,278,298
4.	61	1, 7, 79,189,244,278,298
4.	19	1, 7, 78,189,238,278,298
4.	99	1, 6, 78,187,244,274,298
4.	67	1, 7, 79,189,238,278,298
4.	147	1, 6, 79,187,244,274,298
4.	105	1, 6, 78,187,238,274,298
4.	153	1, 6, 79,187,238,274,298
4.	6	1, 7, 78,187,244,275,298
4.	54	1, 7, 79,187,244,275,298
4.	12	1, 7, 78,187,238,275,298
4.	60	1, 7, 79,187,238,275,298
4.	109	1, 6, 78,189,244,278,298
4.	157	1, 6, 79,189,244,278,298
4.	115	1, 6, 78,189,238,278,298
4.	163	1, 6, 79,189,238,278,298
4.	16	1, 7, 78,189,244,279,298
4.	64	1, 7, 79,189,244,279,298
4.	22	1, 7, 78,189,238,279,298
4.	102	1, 6, 78,187,244,275,298
4.	70	1, 7, 79,189,238,279,298
4.	150	1, 6, 79,187,244,275,298
4.	108	1, 6, 78,187,238,275,298
4.	156	1, 6, 79,187,238,275,298
4.	112	1, 6, 78,189,244,279,298
4.	160	1, 6, 79,189,244,279,298
4.	118	1, 6, 78,189,238,279,298
4.	166	1, 6, 79,189,238,279,298



SYSTEM NR		COMPOSITION
5.	3	1, 7, 78,187,244,274,298
5.	51	1, 7, 79,187,244,274,298
5.	9	1, 7, 78,187,238,274,298
5.	57	1, 7, 79,187,238,274,298
5.	99	1, 6, 78,187,244,274,298
5.	147	1, 6, 79,187,244,274,298
5.	105	1, 6, 78,187,238,274,298
5.	13	1, 7, 78,189,244,278,298
5.	153	1, 6, 79,187,238,274,298
5.	61	1, 7, 79,189,244,278,298
5.	19	1, 7, 78,189,238,278,298
5.	67	1, 7, 79,189,238,278,298
5.	6	1, 7, 78,187,244,275,298
5.	54	1, 7, 79,187,244,275,298
5.	12	1, 7, 78,187,238,275,298
5.	60	1, 7, 79,187,238,275,298
5.	109	1, 6, 78,189,244,278,298
5.	157	1, 6, 79,189,244,278,298
5.	115	1, 6, 78,189,238,278,298
5.	163	1, 6, 79,189,238,278,298
5.	102	1, 6, 78,187,244,275,298
5.	150	1, 6, 79,187,244,275,298
5.	108	1, 6, 78,187,238,275,298
5.	16	1, 7, 78,189,244,279,298
5.	156	1, 6, 79,187,238,275,298
5.	64	1, 7, 79,189,244,279,298
5.	22	1, 7, 78,189,238,279,298
5.	70	1, 7, 79,189,238,279,298
5.	112	1, 6, 78,189,244,279,298
5.	160	1, 6, 79,189,244,279,298
5.	118	1, 6, 78,189,238,279,298
5.	166	1, 6, 79,189,238,279,298

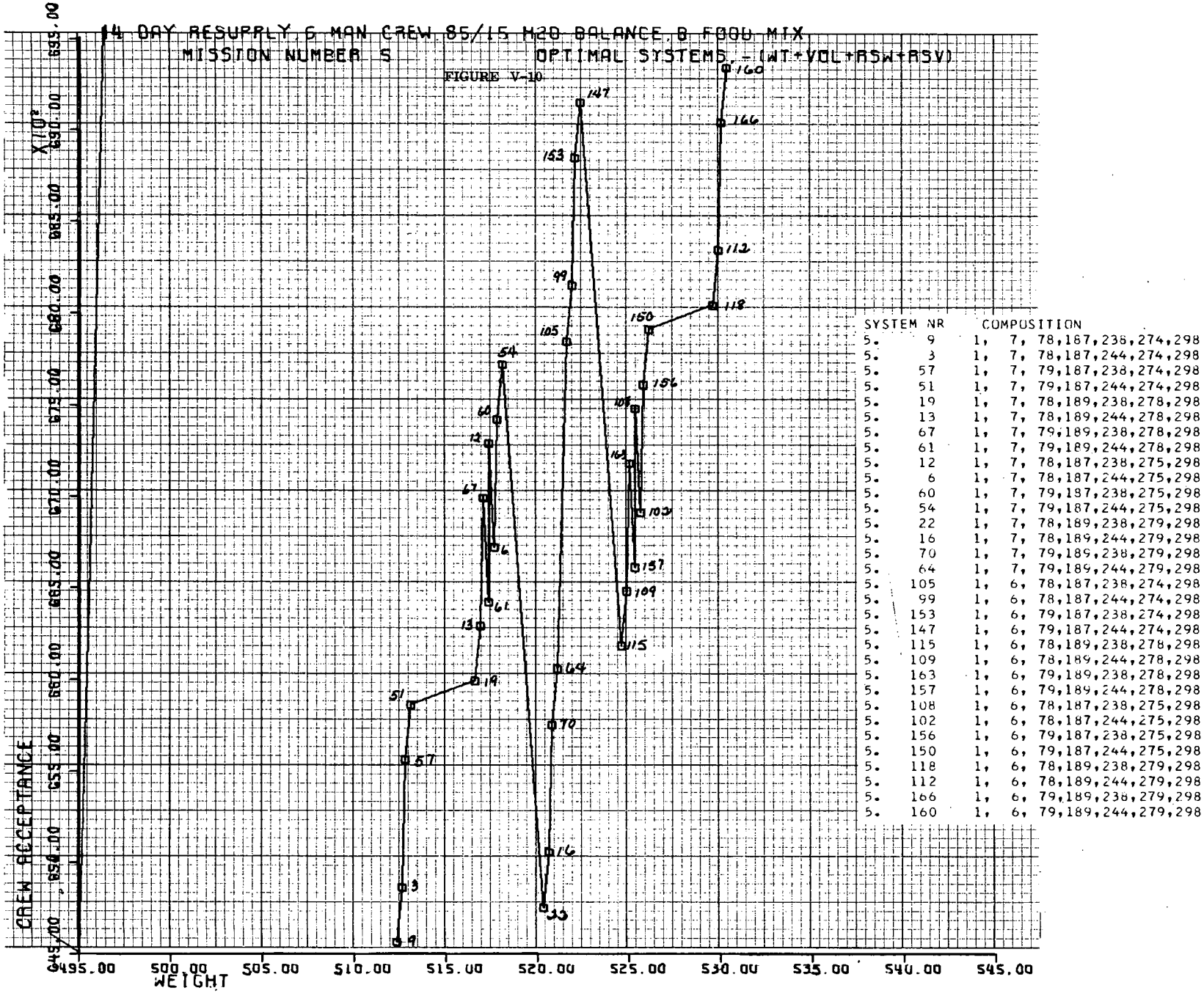


FIGURE V-10

SYSTEM NR		COMPOSITION
5.	9	1, 7, 78,187,238,274,298
5.	3	1, 7, 78,187,244,274,298
5.	57	1, 7, 79,187,238,274,298
5.	51	1, 7, 79,187,244,274,298
5.	19	1, 7, 78,189,238,278,298
5.	13	1, 7, 78,189,244,278,298
5.	67	1, 7, 79,189,238,278,298
5.	61	1, 7, 79,189,244,278,298
5.	12	1, 7, 78,187,238,275,298
5.	6	1, 7, 78,187,244,275,298
5.	60	1, 7, 79,187,238,275,298
5.	54	1, 7, 79,187,244,275,298
5.	22	1, 7, 78,189,238,279,298
5.	16	1, 7, 78,189,244,279,298
5.	70	1, 7, 79,189,238,279,298
5.	64	1, 7, 79,189,244,279,298
5.	105	1, 6, 78,187,238,274,298
5.	99	1, 6, 78,187,244,274,298
5.	153	1, 6, 79,187,238,274,298
5.	147	1, 6, 79,187,244,274,298
5.	115	1, 6, 78,189,238,278,298
5.	109	1, 6, 78,189,244,278,298
5.	163	1, 6, 79,189,238,278,298
5.	157	1, 6, 79,189,244,278,298
5.	108	1, 6, 78,187,238,275,298
5.	102	1, 6, 78,187,244,275,298
5.	156	1, 6, 79,187,238,275,298
5.	150	1, 6, 79,187,244,275,298
5.	118	1, 6, 78,189,238,279,298
5.	112	1, 6, 78,189,244,279,298
5.	166	1, 6, 79,189,238,279,298
5.	160	1, 6, 79,189,244,279,298

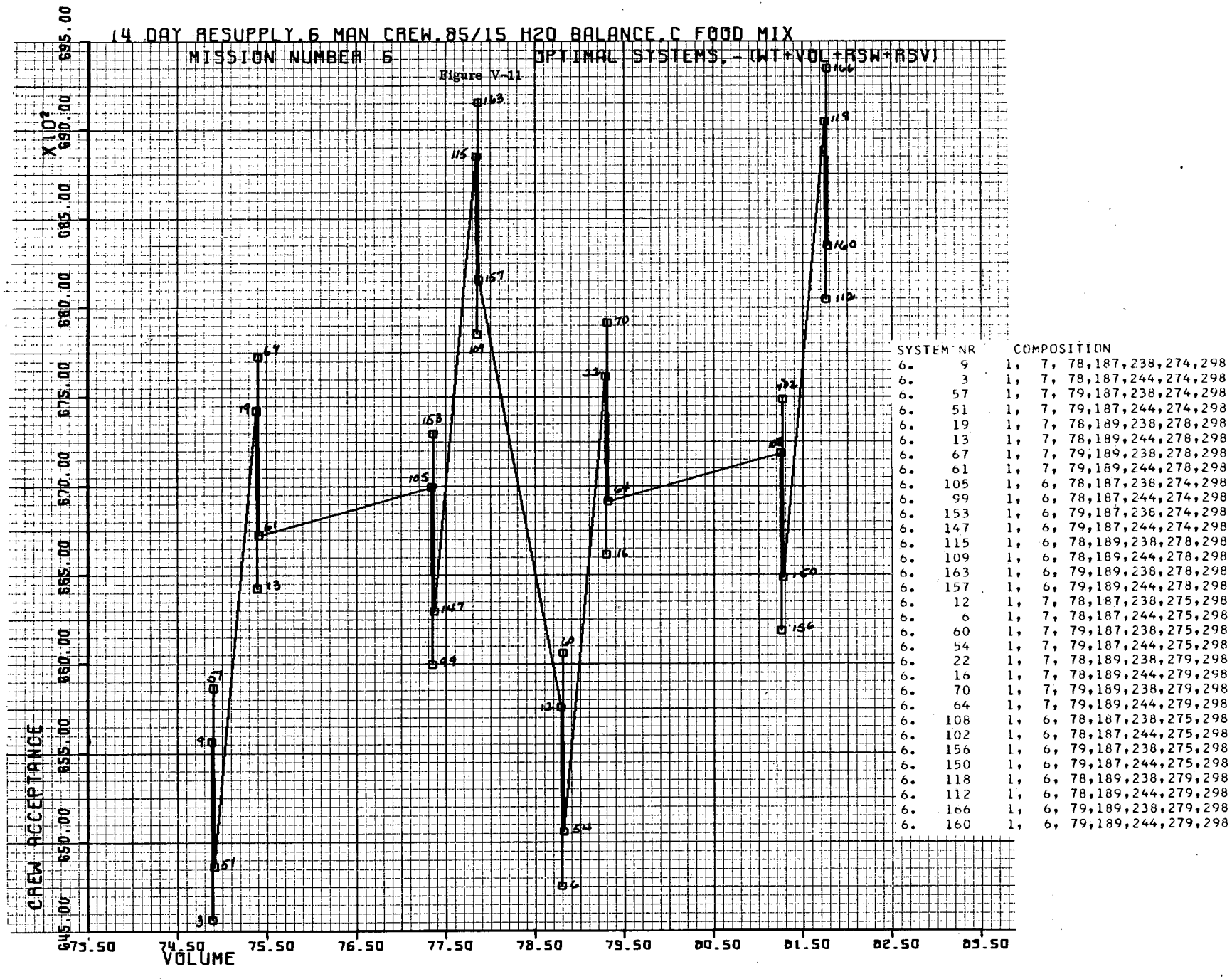

14 DAY RESUPPLY,6 MAN CREW,85/15 H2O BALANCE,C FOOD MIX
MISSION NUMBER 6
OPTIMAL SYSTEMS,-(WT+VOL+RSW+RSV)
X 10²
CREW ACCEPTANCE
VOLUME
695.00
690.00
685.00
680.00
675.00
670.00
665.00
660.00
655.00
650.00
645.00
73.50
74.50
75.50
76.50
77.50
78.50
79.50
80.50
81.50
82.50
83.50
SYSTEM NR COMPOSITION
6. 9 1, 7, 78,187,238,274,298
6. 3 1, 7, 78,187,244,274,298
6. 57 1, 7, 79,187,238,274,298
6. 51 1, 7, 79,187,244,274,298
6. 19 1, 7, 78,189,238,278,298
6. 13 1, 7, 78,189,244,278,298
6. 67 1, 7, 79,189,238,278,298
6. 61 1, 7, 79,189,244,278,298
6. 105 1, 6, 78,187,238,274,298
6. 99 1, 6, 78,187,244,274,298
6. 153 1, 6, 79,187,238,274,298
6. 147 1, 6, 79,187,244,274,298
6. 115 1, 6, 78,189,238,278,298
6. 109 1, 6, 78,189,244,278,298
6. 163 1, 6, 79,189,238,278,298
6. 157 1, 6, 79,189,244,278,298
6. 12 1, 7, 78,187,238,275,298
6. 6 1, 7, 78,187,244,275,298
6. 60 1, 7, 79,187,238,275,298
6. 54 1, 7, 79,187,244,275,298
6. 22 1, 7, 78,189,238,279,298
6. 16 1, 7, 78,189,244,279,298
6. 70 1, 7, 79,189,238,279,298
6. 64 1, 7, 79,189,244,279,298
6. 108 1, 6, 78,187,238,275,298
6. 102 1, 6, 78,187,244,275,298
6. 156 1, 6, 79,187,238,275,298
6. 150 1, 6, 79,187,244,275,298
6. 118 1, 6, 78,189,238,279,298
6. 112 1, 6, 78,189,244,279,298
6. 166 1, 6, 79,189,238,279,298
6. 160 1, 6, 79,189,244,279,298

Figure V-11

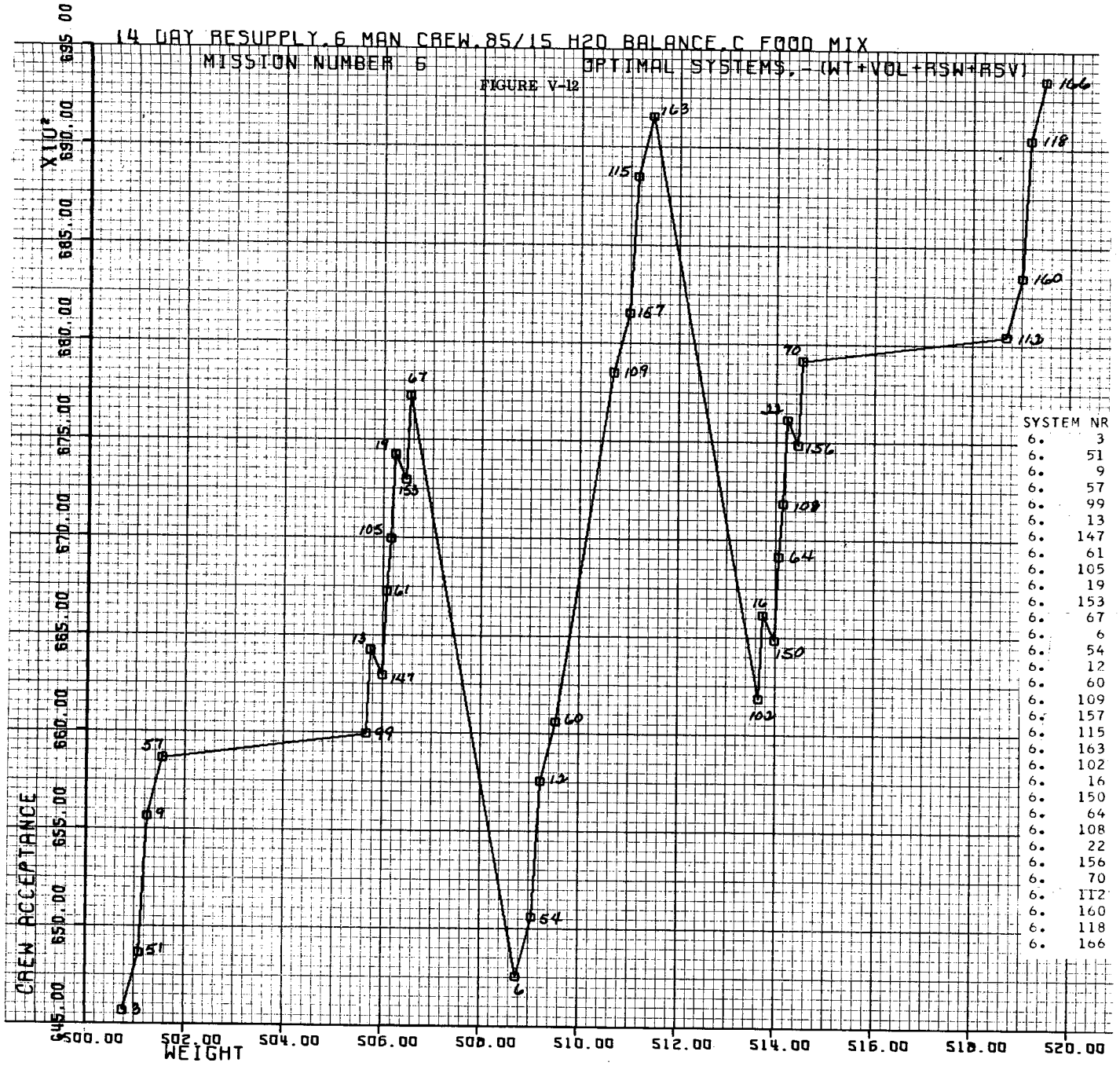
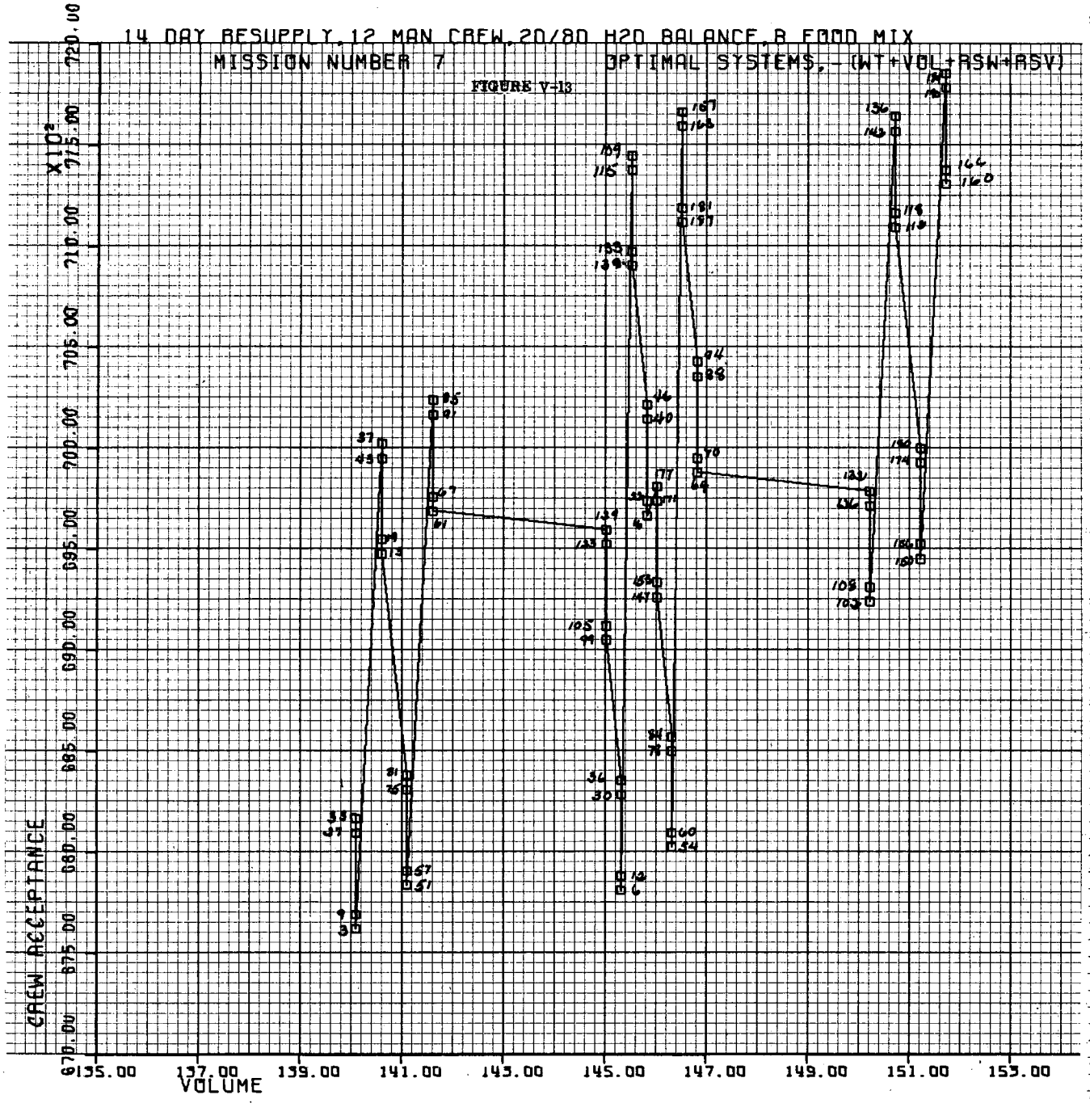
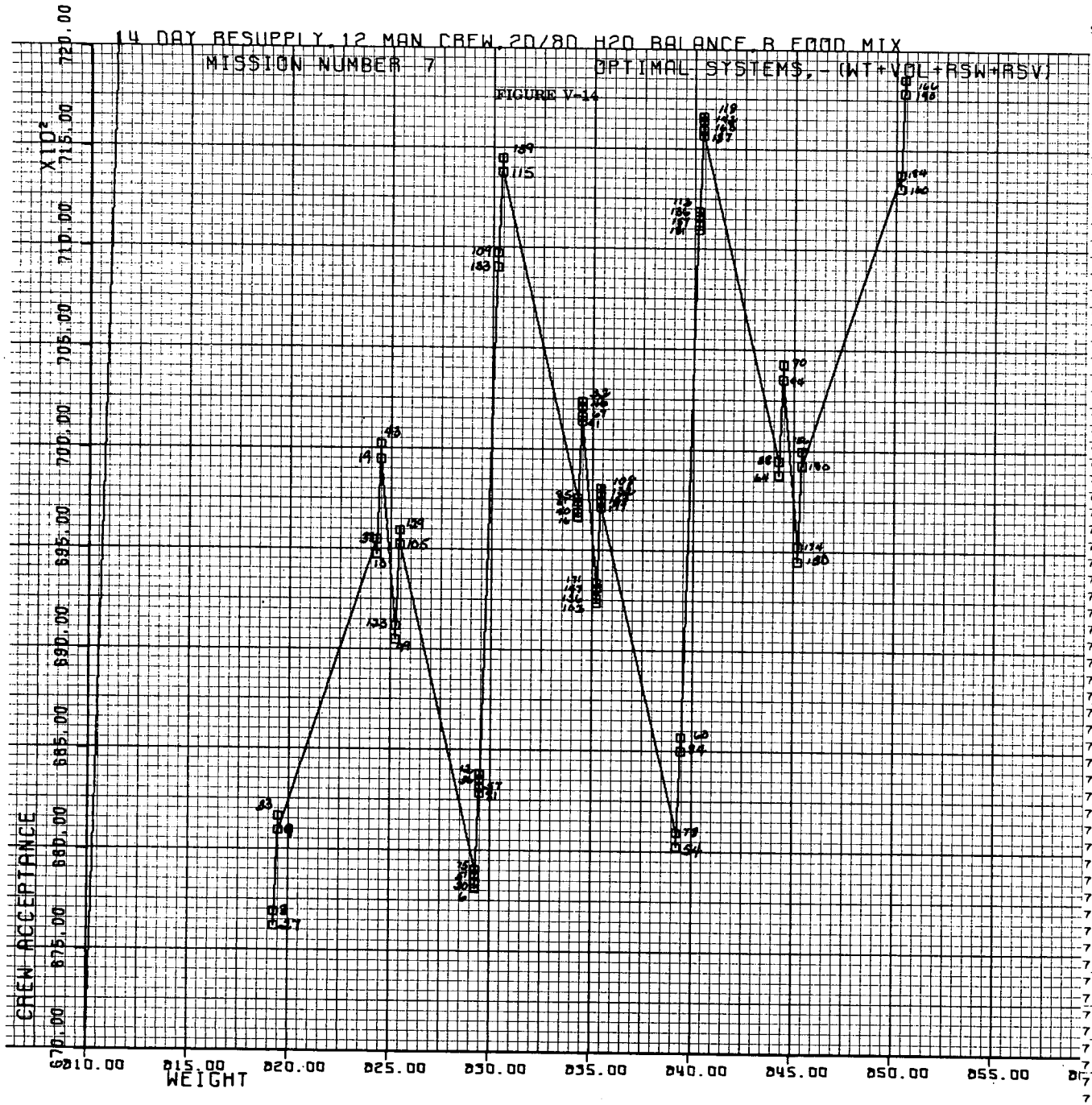


FIGURE V-12

SYSTEM NR	COMPOSITION
6. 3	1, 7, 78,187,244,274,298
6. 51	1, 7, 79,187,244,274,298
6. 9	1, 7, 78,187,238,274,298
6. 57	1, 7, 79,187,238,274,298
6. 99	1, 6, 78,187,244,274,298
6. 13	1, 7, 78,189,244,278,298
6. 147	1, 6, 79,187,244,274,298
6. 61	1, 7, 79,189,244,278,298
6. 105	1, 6, 78,187,238,274,298
6. 19	1, 7, 78,189,238,278,298
6. 153	1, 6, 79,187,238,274,298
6. 67	1, 7, 79,189,238,278,298
6. 6	1, 7, 78,187,244,275,298
6. 54	1, 7, 79,187,244,275,298
6. 12	1, 7, 78,187,238,275,298
6. 60	1, 7, 79,187,238,275,298
6. 109	1, 6, 78,189,244,278,298
6. 157	1, 6, 79,189,244,278,298
6. 115	1, 6, 78,189,238,278,298
6. 163	1, 6, 79,189,238,278,298
6. 102	1, 6, 78,187,244,275,298
6. 16	1, 7, 78,189,244,279,298
6. 150	1, 6, 79,187,244,275,298
6. 64	1, 7, 79,189,244,279,298
6. 108	1, 6, 78,187,238,275,298
6. 22	1, 7, 78,189,238,279,298
6. 156	1, 6, 79,187,238,275,298
6. 70	1, 7, 79,189,238,279,298
6. 112	1, 6, 78,189,244,279,298
6. 160	1, 6, 79,189,244,279,298
6. 118	1, 6, 78,189,238,279,298
6. 166	1, 6, 79,189,238,279,298



SYSTEM NR		COMPOSITION
7.	33	1. 7. 78,187,248,274,298
7.	27	1. 7. 78,187,244,274,298
7.	9	1. 7. 79,187,248,274,298
7.	3	1. 7. 79,187,244,274,298
7.	43	1. 7. 78,189,248,278,298
7.	37	1. 7. 78,189,244,278,298
7.	19	1. 7. 79,189,248,278,298
7.	13	1. 7. 79,189,244,278,298
7.	81	1. 7. 76,187,248,274,298
7.	75	1. 7. 76,187,244,274,298
7.	57	1. 7. 77,187,248,274,298
7.	51	1. 7. 77,187,244,274,298
7.	91	1. 7. 76,189,248,278,298
7.	85	1. 7. 76,189,244,278,298
7.	67	1. 7. 77,189,248,278,298
7.	61	1. 7. 77,189,244,278,298
7.	129	1. 6. 78,187,248,274,298
7.	123	1. 6. 78,187,244,274,298
7.	105	1. 6. 79,187,248,274,298
7.	99	1. 6. 79,187,244,274,298
7.	36	1. 7. 78,187,248,275,298
7.	30	1. 7. 78,187,244,275,298
7.	12	1. 7. 79,187,248,275,298
7.	6	1. 7. 79,187,244,275,298
7.	139	1. 6. 78,189,248,278,298
7.	133	1. 6. 78,189,244,278,298
7.	115	1. 6. 79,189,248,278,298
7.	109	1. 6. 79,189,244,278,298
7.	46	1. 7. 78,189,248,279,298
7.	40	1. 7. 78,189,244,279,298
7.	22	1. 7. 79,189,248,279,298
7.	16	1. 7. 79,189,244,279,298
7.	177	1. 6. 76,187,248,274,298
7.	171	1. 6. 76,187,244,274,298
7.	153	1. 6. 77,187,248,274,298
7.	147	1. 6. 77,187,244,274,298
7.	84	1. 7. 76,187,248,275,298
7.	78	1. 7. 76,187,244,275,298
7.	60	1. 7. 77,187,248,275,298
7.	54	1. 7. 77,187,244,275,298
7.	187	1. 6. 76,189,248,278,298
7.	181	1. 6. 76,189,244,278,298
7.	163	1. 6. 77,189,248,278,298
7.	157	1. 6. 77,189,244,278,298
7.	94	1. 7. 76,189,248,279,298
7.	88	1. 7. 76,189,244,279,298
7.	70	1. 7. 77,189,248,279,298
7.	64	1. 7. 77,189,244,279,298
7.	132	1. 6. 78,187,248,275,298
7.	126	1. 6. 78,187,244,275,298
7.	108	1. 6. 79,187,248,275,298
7.	102	1. 6. 79,187,244,275,298
7.	142	1. 6. 78,189,248,279,298
7.	136	1. 6. 78,189,244,279,298
7.	118	1. 6. 79,189,248,279,298
7.	112	1. 6. 79,189,244,279,298
7.	180	1. 6. 76,187,248,275,298
7.	174	1. 6. 76,187,244,275,298
7.	156	1. 6. 77,187,248,275,298
7.	150	1. 6. 77,187,244,275,298
7.	190	1. 6. 76,189,248,279,298
7.	184	1. 6. 76,189,244,279,298
7.	166	1. 6. 77,189,248,279,298
7.	160	1. 6. 77,189,244,279,298



SYSTEM NR		COMPOSITION
7.	27	1. 7. 78.187.244.274.298
7.	3	1. 7. 79.187.244.274.298
7.	33	1. 7. 78.187.248.274.298
7.	9	1. 7. 79.187.248.274.298
7.	37	1. 7. 78.189.244.278.298
7.	13	1. 7. 79.189.244.278.298
7.	43	1. 7. 78.189.248.278.298
7.	19	1. 7. 79.189.248.278.298
7.	123	1. 6. 78.187.244.274.298
7.	99	1. 6. 79.187.244.274.298
7.	129	1. 6. 78.187.248.274.298
7.	105	1. 6. 79.187.248.274.298
7.	75	1. 7. 76.187.244.274.298
7.	51	1. 7. 77.187.244.274.298
7.	30	1. 7. 78.187.244.275.298
7.	6	1. 7. 79.187.244.275.298
7.	81	1. 7. 76.187.248.274.298
7.	57	1. 7. 77.187.248.274.298
7.	36	1. 7. 78.187.248.275.298
7.	12	1. 7. 79.187.248.275.298
7.	133	1. 6. 78.189.244.278.298
7.	109	1. 6. 79.189.244.278.298
7.	139	1. 6. 78.189.248.278.298
7.	115	1. 6. 79.189.248.278.298
7.	85	1. 7. 76.189.244.278.298
7.	61	1. 7. 77.189.244.278.298
7.	40	1. 7. 78.189.244.279.298
7.	16	1. 7. 79.189.244.279.298
7.	91	1. 7. 76.189.248.278.298
7.	67	1. 7. 77.189.248.278.298
7.	46	1. 7. 78.189.248.279.298
7.	22	1. 7. 79.189.248.279.298
7.	171	1. 6. 76.187.244.274.298
7.	147	1. 6. 77.187.244.274.298
7.	126	1. 6. 78.187.244.275.298
7.	102	1. 6. 79.187.244.275.298
7.	177	1. 6. 76.187.248.274.298
7.	153	1. 6. 77.187.248.274.298
7.	132	1. 6. 78.187.248.275.298
7.	109	1. 6. 79.187.248.275.298
7.	78	1. 7. 76.187.244.275.298
7.	54	1. 7. 77.187.244.275.298
7.	84	1. 7. 76.187.248.275.298
7.	60	1. 7. 77.187.248.275.298
7.	181	1. 6. 76.189.244.278.298
7.	157	1. 6. 77.189.244.278.298
7.	136	1. 6. 78.189.244.279.298
7.	112	1. 6. 79.189.244.279.298
7.	187	1. 6. 76.189.248.278.298
7.	163	1. 6. 77.189.248.278.298
7.	142	1. 6. 78.189.248.279.298
7.	118	1. 6. 79.189.248.279.298
7.	88	1. 7. 76.189.244.279.298
7.	64	1. 7. 77.189.244.279.298
7.	94	1. 7. 76.189.248.279.298
7.	70	1. 7. 77.189.248.279.298
7.	174	1. 6. 76.187.244.275.298
7.	150	1. 6. 77.187.244.275.298
7.	180	1. 6. 76.187.248.275.298
7.	156	1. 6. 77.187.248.275.298
7.	184	1. 6. 76.189.244.279.298
7.	160	1. 6. 77.189.244.279.298
7.	190	1. 6. 76.189.248.279.298
7.	166	1. 6. 77.189.248.279.298

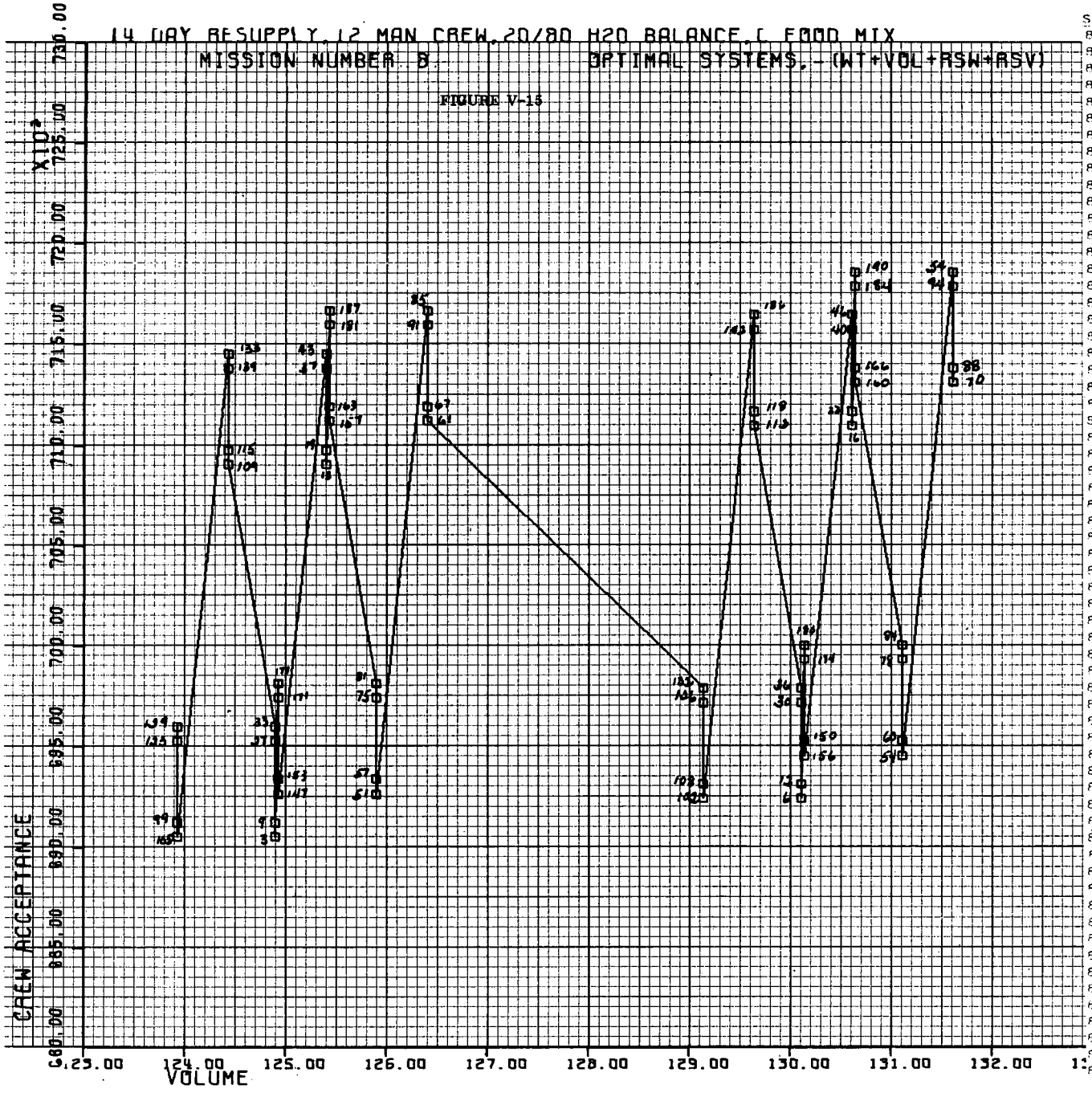


FIGURE V-15

SYSTEM NR		COMPOSITION
8.	129	1. 5. 78,187,248,274,298
8.	123	1. 5. 78,187,244,274,298
8.	105	1. 5. 79,187,248,274,298
8.	99	1. 5. 79,187,244,274,298
8.	139	1. 5. 78,189,248,278,298
8.	133	1. 5. 78,189,244,278,298
8.	115	1. 5. 79,189,248,278,298
8.	109	1. 5. 79,189,244,278,298
8.	33	1. 7. 78,187,248,274,298
8.	27	1. 7. 78,187,244,274,298
8.	9	1. 7. 79,187,248,274,298
8.	3	1. 7. 79,187,244,274,298
8.	177	1. 5. 76,187,248,274,298
8.	171	1. 5. 76,187,244,274,298
8.	153	1. 5. 77,187,248,274,298
8.	147	1. 5. 77,187,244,274,298
8.	43	1. 7. 78,189,248,278,298
8.	37	1. 7. 78,189,244,278,298
8.	19	1. 7. 79,189,248,278,298
8.	13	1. 7. 79,189,244,278,298
8.	187	1. 5. 76,189,248,278,298
8.	181	1. 5. 76,189,244,278,298
8.	163	1. 5. 77,189,248,278,298
8.	157	1. 5. 77,189,244,278,298
8.	81	1. 7. 76,187,248,274,298
8.	75	1. 7. 76,187,244,274,298
8.	57	1. 7. 77,187,248,274,298
8.	51	1. 7. 77,187,244,274,298
8.	91	1. 7. 76,189,248,278,298
8.	85	1. 7. 76,189,244,278,298
8.	67	1. 7. 77,189,248,278,298
8.	61	1. 7. 77,189,244,278,298
8.	132	1. 5. 78,187,248,275,298
8.	126	1. 5. 78,187,244,275,298
8.	108	1. 5. 79,187,248,275,298
8.	102	1. 5. 79,187,244,275,298
8.	142	1. 5. 78,189,248,279,298
8.	136	1. 5. 78,189,244,279,298
8.	118	1. 5. 79,189,248,279,298
8.	112	1. 5. 79,189,244,279,298
8.	36	1. 7. 78,187,248,275,298
8.	30	1. 7. 78,187,244,275,298
8.	12	1. 7. 79,187,248,275,298
8.	6	1. 7. 79,187,244,275,298
8.	180	1. 5. 76,187,248,275,298
8.	174	1. 5. 76,187,244,275,298
8.	156	1. 5. 77,187,248,275,298
8.	150	1. 5. 77,187,244,275,298
8.	46	1. 7. 78,189,248,279,298
8.	40	1. 7. 78,189,244,279,298
8.	22	1. 7. 79,189,248,279,298
8.	16	1. 7. 79,189,244,279,298
8.	190	1. 5. 76,189,248,279,298
8.	184	1. 5. 76,189,244,279,298
8.	166	1. 5. 77,189,248,279,298
8.	160	1. 5. 77,189,244,279,298
8.	94	1. 7. 76,187,248,275,298
8.	78	1. 7. 76,187,244,275,298
8.	60	1. 7. 77,187,248,275,298
8.	54	1. 7. 77,187,244,275,298
8.	94	1. 7. 76,189,248,279,298
8.	88	1. 7. 76,189,244,279,298
8.	70	1. 7. 77,189,248,279,298

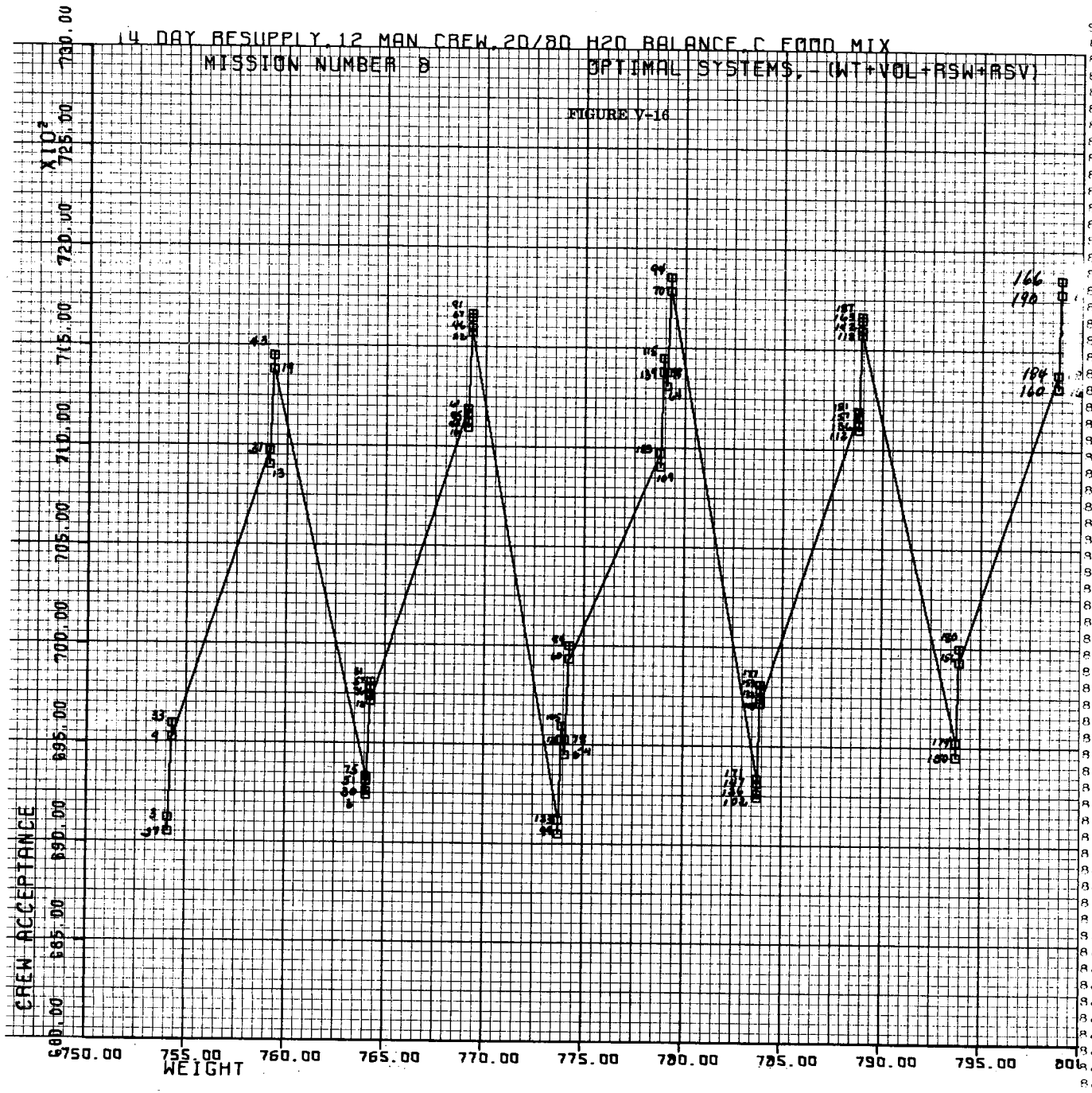


FIGURE V-16

	SYSTEM NR	COMPOSITION
8.	27	1. 7. 78.187.244.274.298
8.	3	1. 7. 79.187.244.274.298
8.	33	1. 7. 78.187.248.274.298
8.	9	1. 7. 79.187.248.274.298
8.	37	1. 7. 78.189.244.278.298
8.	13	1. 7. 79.189.244.278.298
8.	43	1. 7. 78.189.248.278.298
8.	19	1. 7. 79.189.248.278.298
8.	75	1. 7. 76.187.244.274.298
8.	51	1. 7. 77.187.244.274.298
8.	30	1. 7. 78.187.244.275.298
8.	6	1. 7. 79.187.244.275.298
8.	81	1. 7. 76.187.248.274.298
8.	57	1. 7. 77.187.248.274.298
8.	36	1. 7. 78.187.248.275.298
8.	12	1. 7. 79.187.248.275.298
8.	85	1. 7. 76.189.244.278.298
8.	61	1. 7. 77.189.244.278.298
8.	40	1. 7. 78.189.244.279.298
8.	16	1. 7. 79.189.244.279.298
8.	91	1. 7. 76.189.248.278.298
8.	67	1. 7. 77.189.248.278.298
8.	46	1. 7. 78.189.248.279.298
8.	22	1. 7. 79.189.248.279.298
8.	123	1. 5. 78.187.244.274.298
8.	99	1. 5. 79.187.244.274.298
8.	129	1. 5. 78.187.248.274.298
8.	105	1. 5. 79.187.248.274.298
8.	78	1. 7. 76.187.244.275.298
8.	54	1. 7. 77.187.244.275.298
8.	84	1. 7. 76.187.248.275.298
8.	60	1. 7. 77.187.248.275.298
8.	133	1. 5. 78.189.244.278.298
8.	109	1. 5. 79.189.244.278.298
8.	139	1. 5. 78.189.248.278.298
8.	115	1. 5. 79.189.248.278.298
8.	88	1. 7. 76.189.244.279.298
8.	64	1. 7. 77.189.244.279.298
8.	94	1. 7. 76.189.248.279.298
8.	70	1. 7. 77.189.248.279.298
8.	171	1. 5. 76.187.244.274.298
8.	147	1. 5. 77.187.244.274.298
8.	126	1. 5. 78.187.244.275.298
8.	102	1. 5. 79.187.244.275.298
8.	177	1. 5. 76.187.248.274.298
8.	153	1. 5. 77.187.248.274.298
8.	132	1. 5. 78.187.248.275.298
8.	108	1. 5. 79.187.248.275.298
8.	181	1. 5. 76.189.244.278.298
8.	157	1. 5. 77.189.244.278.298
8.	136	1. 5. 78.189.244.279.298
8.	112	1. 5. 79.189.244.279.298
8.	187	1. 5. 76.189.248.278.298
8.	163	1. 5. 77.189.248.278.298
8.	142	1. 5. 78.189.248.279.298
8.	118	1. 5. 79.189.248.279.298
8.	174	1. 5. 76.187.244.275.298
8.	150	1. 5. 77.187.244.275.298
8.	180	1. 5. 76.187.248.275.298
8.	156	1. 5. 77.187.248.275.298
8.	184	1. 5. 76.189.244.279.298
8.	160	1. 5. 77.189.244.279.298
8.	190	1. 5. 76.189.248.279.298
8.	166	1. 5. 77.189.248.279.298

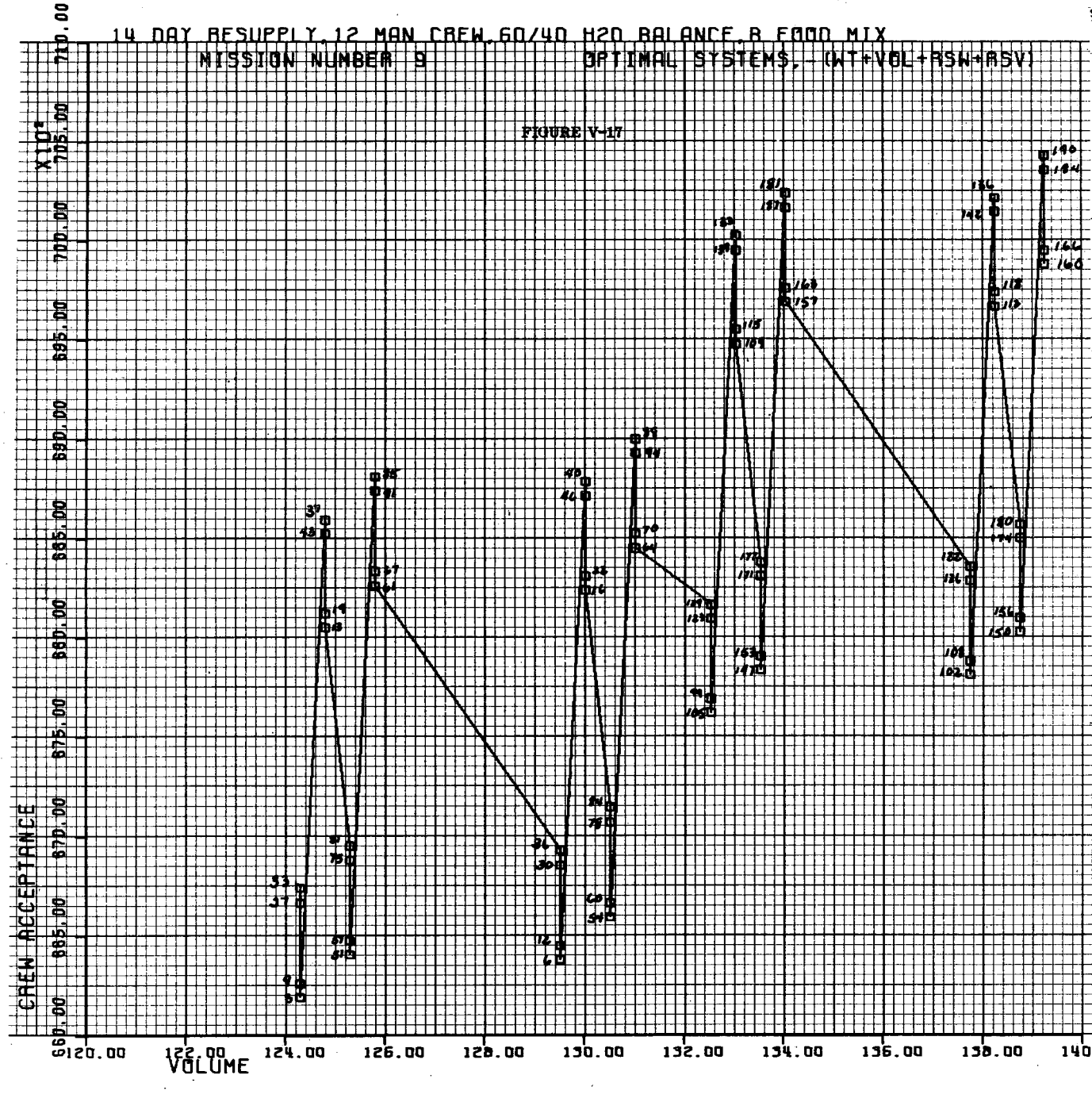


FIGURE V-17

SYSTEM	NR		COMPOSITION
9.	33	1.	7. 78,187,248,274,298
9.	27	1.	7. 78,187,244,274,298
9.	9	1.	7. 79,187,248,274,298
9.	3	1.	7. 79,187,244,274,298
9.	43	1.	7. 78,189,248,278,298
9.	37	1.	7. 78,189,244,278,298
9.	19	1.	7. 79,189,248,278,298
9.	13	1.	7. 79,189,244,278,298
9.	81	1.	7. 76,187,248,274,298
9.	75	1.	7. 76,187,244,274,298
9.	57	1.	7. 77,187,248,274,298
9.	51	1.	7. 77,187,244,274,298
9.	91	1.	7. 76,189,248,278,298
9.	85	1.	7. 76,189,244,278,298
9.	67	1.	7. 77,189,248,278,298
9.	61	1.	7. 77,189,244,278,298
9.	35	1.	7. 78,187,248,275,298
9.	30	1.	7. 78,187,244,275,298
9.	12	1.	7. 79,187,248,275,298
9.	6	1.	7. 79,187,244,275,298
9.	46	1.	7. 78,189,248,279,298
9.	40	1.	7. 78,189,244,279,298
9.	22	1.	7. 79,189,248,279,298
9.	16	1.	7. 79,189,244,279,298
9.	84	1.	7. 76,187,248,275,298
9.	78	1.	7. 76,187,244,275,298
9.	60	1.	7. 77,187,248,275,298
9.	54	1.	7. 77,187,244,275,298
9.	94	1.	7. 76,189,248,279,298
9.	88	1.	7. 76,189,244,279,298
9.	70	1.	7. 77,189,248,279,298
9.	64	1.	7. 77,189,244,279,298
9.	129	1.	6. 78,187,248,274,298
9.	123	1.	6. 78,187,244,274,298
9.	105	1.	6. 79,187,248,274,298
9.	99	1.	6. 79,187,244,274,298
9.	139	1.	6. 78,189,248,278,298
9.	133	1.	6. 78,189,244,278,298
9.	115	1.	6. 79,189,248,278,298
9.	109	1.	6. 79,189,244,278,298
9.	177	1.	6. 76,187,248,274,298
9.	171	1.	6. 76,187,244,274,298
9.	153	1.	6. 77,187,248,274,298
9.	147	1.	6. 77,187,244,274,298
9.	187	1.	6. 76,189,248,278,298
9.	181	1.	6. 76,189,244,278,298
9.	163	1.	6. 77,189,248,278,298
9.	157	1.	6. 77,189,244,278,298
9.	132	1.	6. 78,187,248,275,298
9.	126	1.	6. 78,187,244,275,298
9.	108	1.	6. 79,187,248,275,298
9.	102	1.	6. 79,187,244,275,298
9.	142	1.	6. 78,189,248,279,298
9.	136	1.	6. 78,189,244,279,298
9.	118	1.	6. 79,189,248,279,298
9.	112	1.	6. 79,189,244,279,298
9.	180	1.	6. 76,187,248,275,298
9.	174	1.	6. 76,187,244,275,298
9.	156	1.	6. 77,187,248,275,298
9.	150	1.	6. 77,187,244,275,298
9.	190	1.	6. 76,189,248,279,298
9.	184	1.	6. 76,189,244,279,298
9.	166	1.	6. 77,189,248,279,298
9.	160	1.	6. 77,189,244,279,298

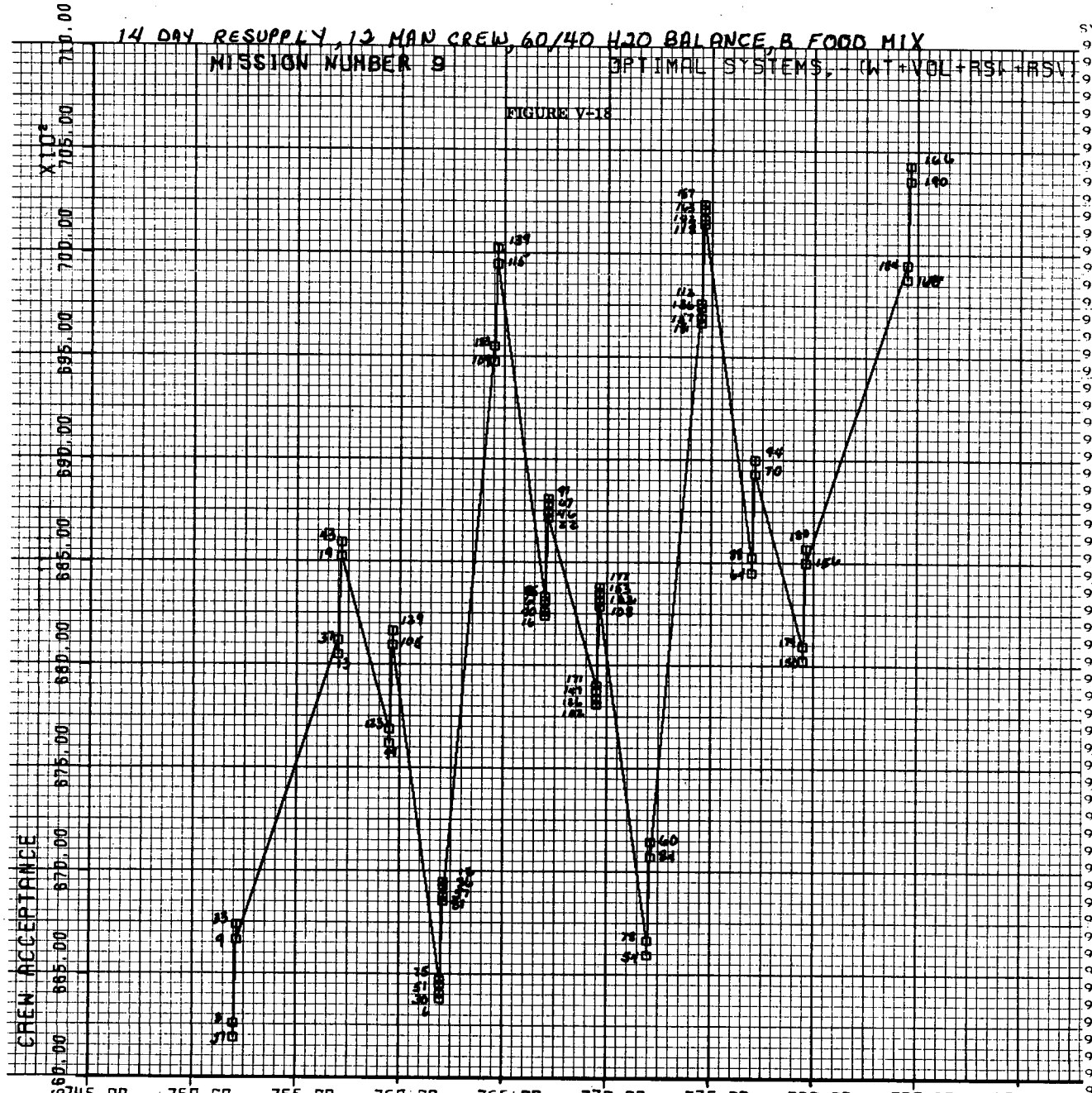


FIGURE V-18

SYSTEM NR		COMPOSITION
9.	27	1. 7. 78,187,244,274,298
9.	3	1. 7. 79,187,244,274,298
9.	33	1. 7. 78,187,248,274,298
9.	9	1. 7. 79,187,248,274,298
9.	37	1. 7. 78,189,244,278,298
9.	13	1. 7. 79,189,244,278,298
9.	43	1. 7. 78,189,248,278,298
9.	19	1. 7. 79,189,248,278,298
9.	123	1. 6. 78,187,244,274,298
9.	99	1. 6. 79,187,244,274,298
9.	129	1. 6. 78,187,248,274,298
9.	105	1. 6. 79,187,248,274,298
9.	75	1. 7. 76,187,244,274,298
9.	51	1. 7. 77,187,244,274,298
9.	30	1. 7. 78,187,244,275,298
9.	6	1. 7. 79,187,244,275,298
9.	81	1. 7. 76,187,248,274,298
9.	57	1. 7. 77,187,248,274,298
9.	36	1. 7. 78,187,248,275,298
9.	12	1. 7. 79,187,248,275,298
9.	133	1. 6. 78,189,244,278,298
9.	109	1. 6. 79,189,244,278,298
9.	139	1. 6. 78,189,248,278,298
9.	115	1. 6. 79,189,248,278,298
9.	85	1. 7. 76,189,244,278,298
9.	61	1. 7. 77,189,244,278,298
9.	40	1. 7. 78,189,244,279,298
9.	16	1. 7. 79,189,244,279,298
9.	91	1. 7. 76,189,248,278,298
9.	67	1. 7. 77,189,248,278,298
9.	46	1. 7. 78,189,248,279,298
9.	22	1. 7. 79,189,248,279,298
9.	171	1. 6. 76,187,244,274,298
9.	147	1. 6. 77,187,244,274,298
9.	126	1. 6. 78,187,244,275,298
9.	102	1. 6. 79,187,244,275,298
9.	177	1. 6. 76,187,248,274,298
9.	153	1. 6. 77,187,248,274,298
9.	132	1. 6. 78,187,248,275,298
9.	108	1. 6. 79,187,248,275,298
9.	78	1. 7. 76,187,244,275,298
9.	54	1. 7. 77,187,244,275,298
9.	84	1. 7. 76,187,248,275,298
9.	60	1. 7. 77,187,248,275,298
9.	181	1. 6. 76,189,244,278,298
9.	157	1. 6. 77,189,244,278,298
9.	136	1. 6. 78,189,244,279,298
9.	112	1. 6. 79,189,244,279,298
9.	187	1. 6. 76,189,248,278,298
9.	163	1. 6. 77,189,248,278,298
9.	142	1. 6. 78,189,248,279,298
9.	118	1. 6. 79,189,248,279,298
9.	88	1. 7. 75,189,244,279,298
9.	64	1. 7. 77,189,244,279,298
9.	94	1. 7. 76,189,248,279,298
9.	70	1. 7. 77,189,248,279,298
9.	174	1. 6. 76,187,244,275,298
9.	150	1. 6. 77,187,244,275,298
9.	180	1. 6. 76,187,248,275,298
9.	156	1. 6. 77,187,248,275,298
9.	184	1. 6. 76,189,244,279,298
9.	160	1. 6. 77,189,244,279,298
9.	190	1. 6. 76,189,248,279,298
9.	166	1. 6. 77,189,248,279,298

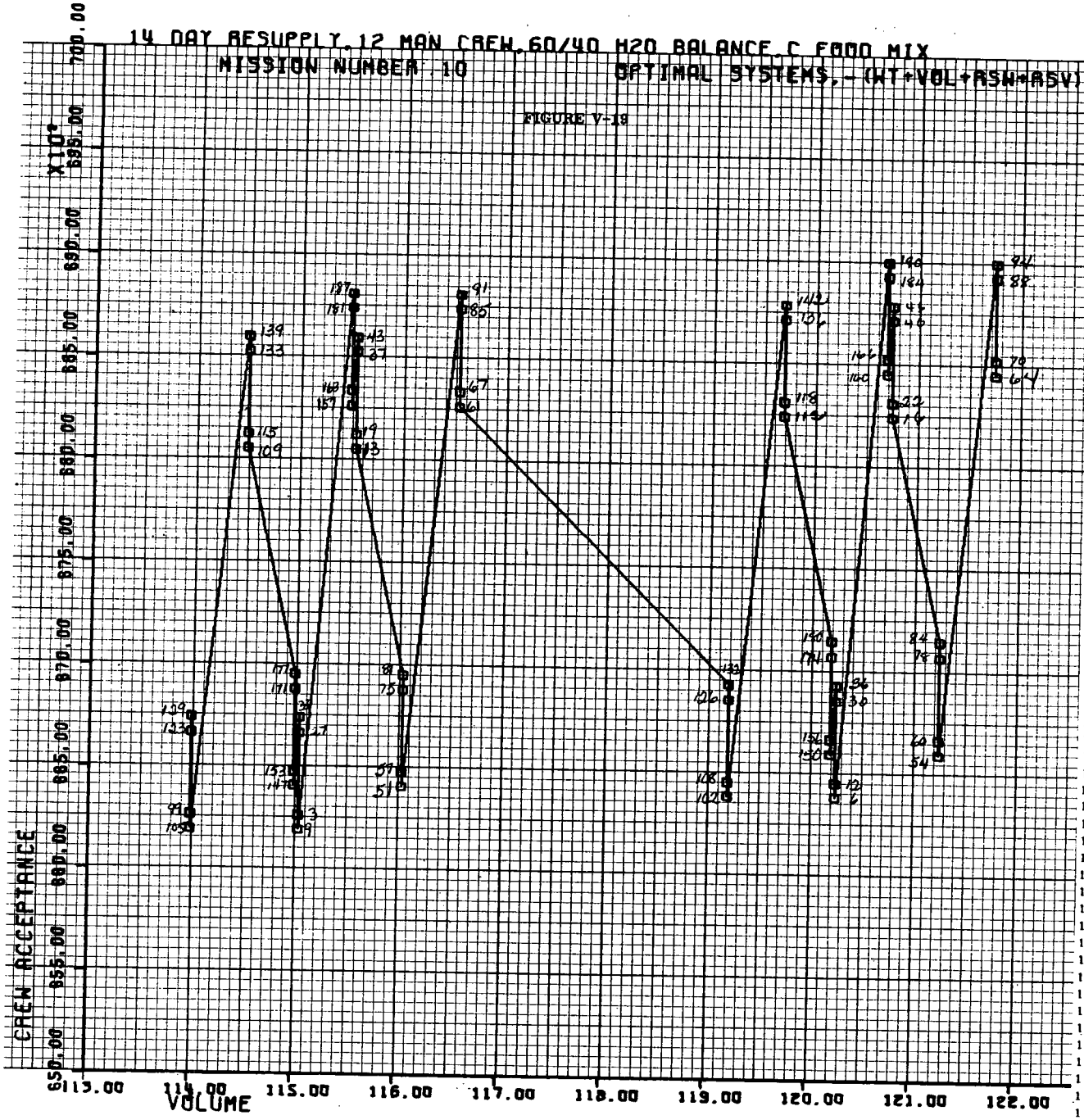
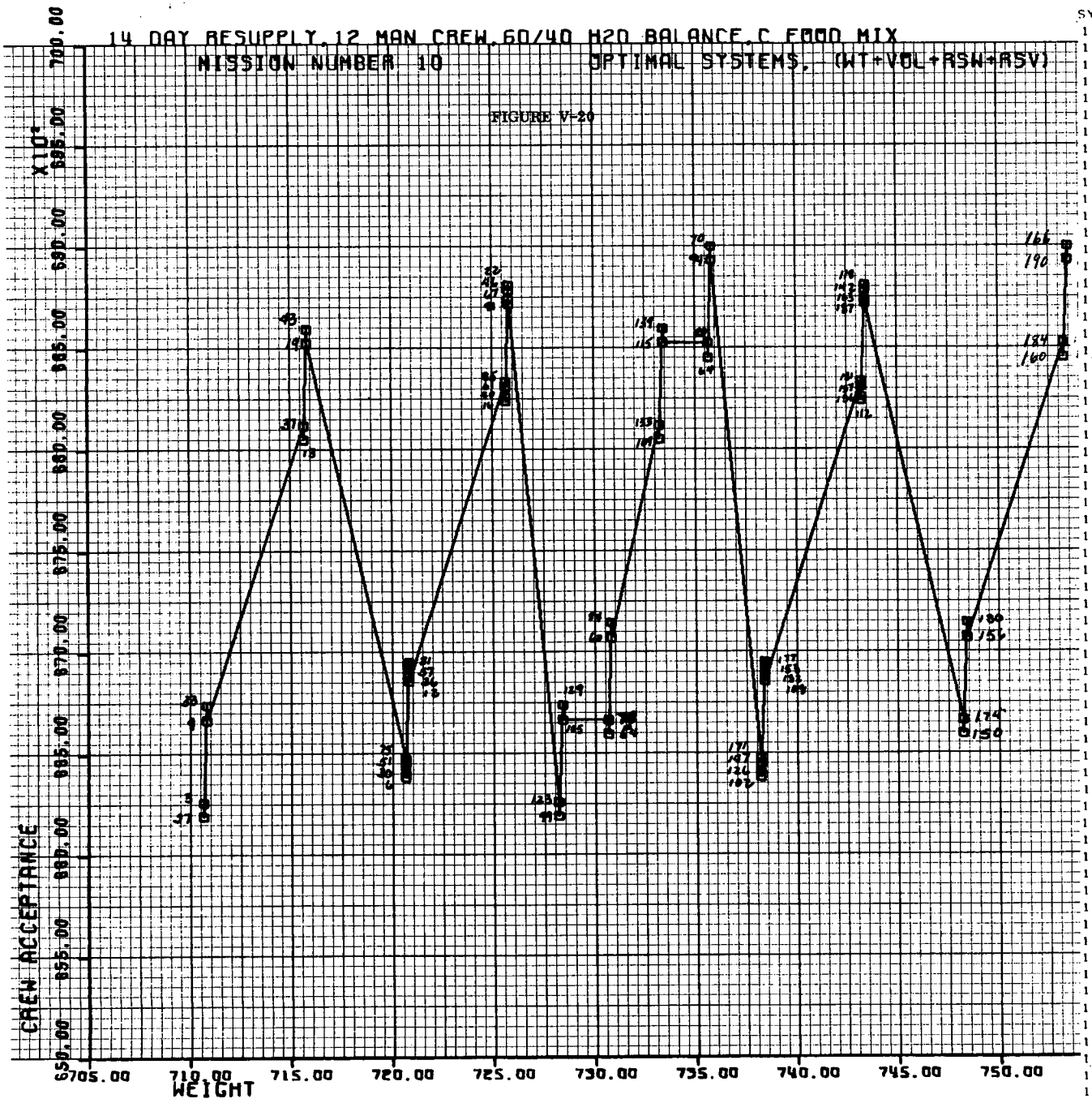


FIGURE V-19

SYSTEM NR		COMPOSITION
10.	129	1. 5. 79.187.248.274.298
10.	123	1. 5. 78.187.244.274.298
10.	105	1. 5. 79.187.248.274.298
10.	99	1. 5. 79.187.244.274.298
10.	139	1. 5. 78.189.248.278.298
10.	133	1. 5. 78.189.244.278.298
10.	115	1. 5. 79.189.248.278.298
10.	109	1. 5. 79.189.244.278.298
10.	177	1. 5. 76.187.248.274.298
10.	171	1. 5. 76.187.244.274.298
10.	153	1. 5. 77.187.248.274.298
10.	147	1. 5. 77.187.244.274.298
10.	33	1. 7. 78.187.248.274.298
10.	27	1. 7. 78.187.244.274.298
10.	9	1. 7. 79.187.248.274.298
10.	3	1. 7. 79.187.244.274.298
10.	187	1. 5. 76.189.248.278.298
10.	181	1. 5. 76.189.244.278.298
10.	163	1. 5. 77.189.248.278.298
10.	157	1. 5. 77.189.244.278.298
10.	43	1. 7. 78.189.248.278.298
10.	37	1. 7. 78.189.244.278.298
10.	19	1. 7. 79.189.248.278.298
10.	13	1. 7. 79.189.244.278.298
10.	81	1. 7. 76.187.248.274.298
10.	75	1. 7. 76.187.244.274.298
10.	57	1. 7. 77.187.248.274.298
10.	51	1. 7. 77.187.244.274.298
10.	91	1. 7. 76.189.248.278.298
10.	85	1. 7. 76.189.244.278.298
10.	67	1. 7. 77.189.248.278.298
10.	61	1. 7. 77.189.244.278.298
10.	132	1. 5. 78.187.248.275.298
10.	126	1. 5. 78.187.244.275.298
10.	108	1. 5. 79.187.248.275.298
10.	102	1. 5. 79.187.244.275.298
10.	142	1. 5. 78.189.248.279.298
10.	136	1. 5. 78.189.244.279.298
10.	118	1. 5. 79.189.248.279.298
10.	112	1. 5. 79.189.244.279.298
10.	180	1. 5. 76.187.248.275.298
10.	174	1. 5. 76.187.244.275.298
10.	156	1. 5. 77.187.248.275.298
10.	150	1. 5. 77.187.244.275.298
10.	36	1. 7. 78.187.248.275.298
10.	30	1. 7. 78.187.244.275.298
10.	12	1. 7. 79.187.248.275.298
10.	6	1. 7. 79.187.244.275.298
10.	190	1. 5. 76.189.248.279.298
10.	184	1. 5. 76.189.244.279.298
10.	166	1. 5. 77.189.248.279.298
10.	160	1. 5. 77.189.244.279.298
10.	46	1. 7. 78.189.248.279.298
10.	40	1. 7. 78.189.244.279.298
10.	22	1. 7. 79.189.248.279.298
10.	16	1. 7. 79.189.244.279.298
10.	84	1. 7. 76.187.248.275.298
10.	78	1. 7. 76.187.244.275.298
10.	60	1. 7. 77.187.248.275.298
10.	54	1. 7. 77.187.244.275.298
10.	94	1. 7. 76.189.248.279.298
10.	88	1. 7. 76.189.244.279.298
10.	70	1. 7. 77.189.248.279.298
10.	64	1. 7. 77.189.244.279.298



SYSTEM NR		COMPOSITION
10.	27	1. 7. 78.187.244.274.298
10.	3	1. 7. 79.187.244.274.298
10.	33	1. 7. 78.187.248.274.298
10.	9	1. 7. 79.187.248.274.298
10.	37	1. 7. 78.189.244.278.298
10.	13	1. 7. 79.189.244.278.298
10.	43	1. 7. 78.189.248.278.298
10.	19	1. 7. 79.189.248.278.298
10.	75	1. 7. 76.187.244.274.298
10.	51	1. 7. 77.187.244.274.298
10.	30	1. 7. 78.187.244.275.298
10.	6	1. 7. 79.187.244.275.298
10.	81	1. 7. 76.187.248.274.298
10.	57	1. 7. 77.187.248.274.298
10.	36	1. 7. 78.187.248.275.298
10.	12	1. 7. 79.187.248.275.298
10.	85	1. 7. 76.189.244.278.298
10.	61	1. 7. 77.189.244.278.298
10.	40	1. 7. 78.189.244.279.298
10.	16	1. 7. 79.189.244.279.298
10.	91	1. 7. 76.189.248.278.298
10.	67	1. 7. 77.189.248.278.298
10.	46	1. 7. 78.189.248.279.298
10.	22	1. 7. 79.189.248.279.298
10.	123	1. 5. 78.187.244.274.298
10.	99	1. 5. 79.187.244.274.298
10.	129	1. 5. 78.187.248.274.298
10.	105	1. 5. 79.187.248.274.298
10.	78	1. 7. 76.187.244.275.298
10.	54	1. 7. 77.187.244.275.298
10.	84	1. 7. 76.187.248.275.298
10.	60	1. 7. 77.187.248.275.298
10.	133	1. 5. 78.189.244.278.298
10.	109	1. 5. 79.189.244.278.298
10.	139	1. 5. 78.189.248.278.298
10.	115	1. 5. 79.189.248.278.298
10.	88	1. 7. 76.189.244.279.298
10.	64	1. 7. 77.189.244.279.298
10.	94	1. 7. 76.189.248.279.298
10.	70	1. 7. 77.189.248.279.298
10.	171	1. 5. 76.187.244.274.298
10.	147	1. 5. 77.187.244.274.298
10.	126	1. 5. 78.187.244.275.298
10.	102	1. 5. 79.187.244.275.298
10.	177	1. 5. 76.187.248.274.298
10.	153	1. 5. 77.187.248.274.298
10.	132	1. 5. 78.187.248.275.298
10.	103	1. 5. 79.187.248.275.298
10.	181	1. 5. 76.189.244.278.298
10.	157	1. 5. 77.189.244.278.298
10.	136	1. 5. 78.189.244.279.298
10.	112	1. 5. 79.189.244.279.298
10.	187	1. 5. 76.189.248.278.298
10.	163	1. 5. 77.189.248.278.298
10.	142	1. 5. 78.189.248.279.298
10.	118	1. 5. 79.189.248.279.298
10.	174	1. 5. 76.187.244.275.298
10.	159	1. 5. 77.187.244.275.298
10.	180	1. 5. 76.187.248.275.298
10.	156	1. 5. 77.187.248.275.298
10.	184	1. 5. 76.189.244.279.298
10.	160	1. 5. 77.189.244.279.298
10.	190	1. 5. 76.189.248.279.298
10.	166	1. 5. 77.189.248.279.298

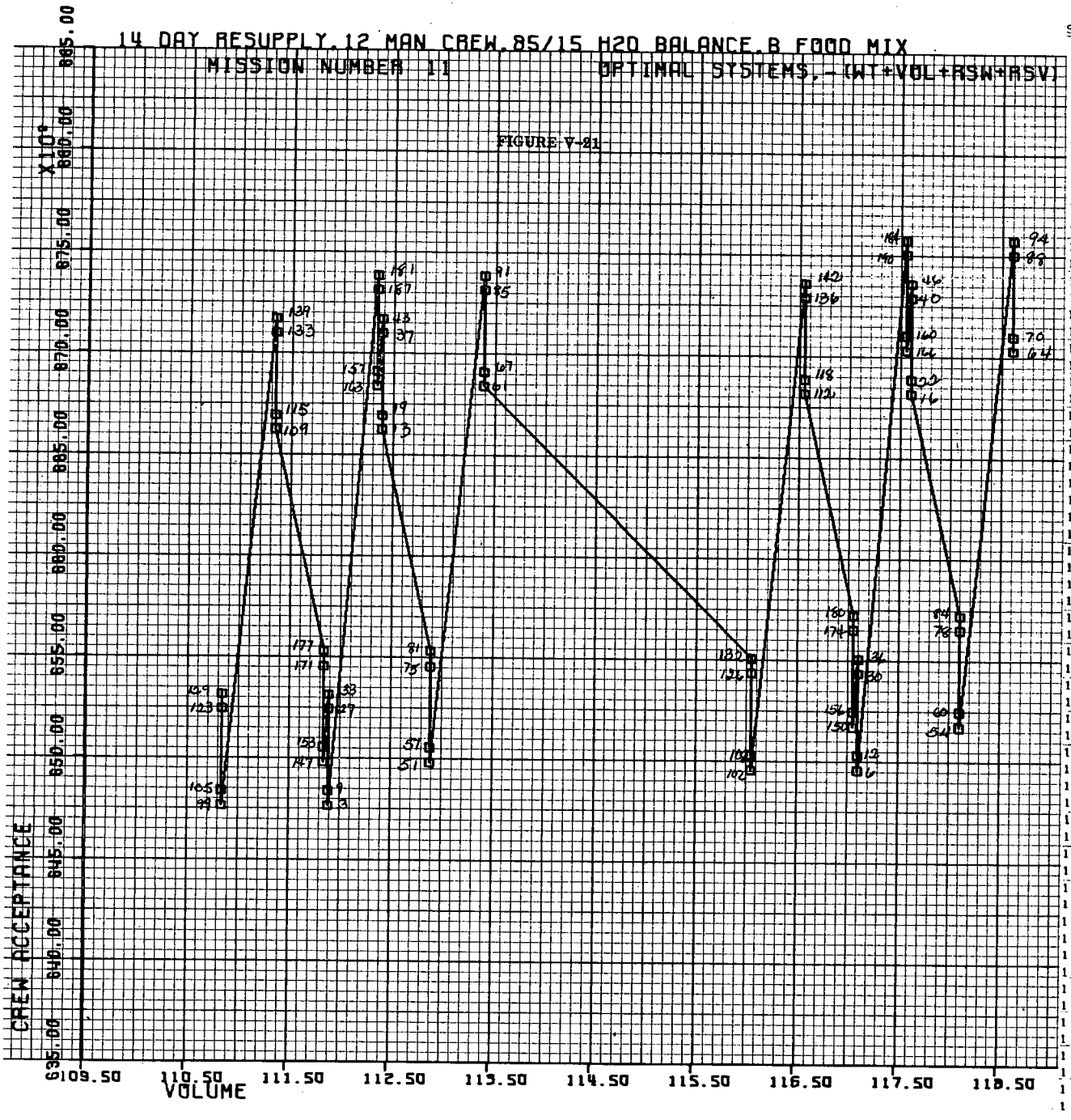


FIGURE V-21

SYSTEM	NR	COMPOSITION
11.	129	1, 5, 78,187,248,274,298
11.	123	1, 5, 78,187,244,274,298
11.	105	1, 5, 79,187,248,274,298
11.	99	1, 5, 79,187,244,274,298
11.	139	1, 5, 78,189,248,278,298
11.	133	1, 5, 79,189,244,278,298
11.	115	1, 5, 79,189,248,278,298
11.	109	1, 5, 79,189,244,278,298
11.	177	1, 5, 76,187,248,274,298
11.	171	1, 5, 76,187,244,274,298
11.	153	1, 5, 77,187,248,274,298
11.	147	1, 5, 77,187,244,274,298
11.	33	1, 7, 78,187,248,274,298
11.	27	1, 7, 78,187,244,274,298
11.	9	1, 7, 79,187,248,274,298
11.	3	1, 7, 79,187,244,274,298
11.	187	1, 5, 76,189,248,278,298
11.	181	1, 5, 76,189,244,278,298
11.	163	1, 5, 77,189,248,278,298
11.	157	1, 5, 77,189,244,278,298
11.	43	1, 7, 78,189,248,278,298
11.	37	1, 7, 78,189,244,278,298
11.	19	1, 7, 79,189,248,278,298
11.	13	1, 7, 79,189,244,278,298
11.	81	1, 7, 76,187,248,274,298
11.	75	1, 7, 76,187,244,274,298
11.	57	1, 7, 77,187,248,274,298
11.	51	1, 7, 77,187,244,274,298
11.	91	1, 7, 76,189,248,278,298
11.	85	1, 7, 76,189,244,278,298
11.	67	1, 7, 77,189,248,278,298
11.	61	1, 7, 77,189,244,278,298
11.	132	1, 5, 78,187,248,275,298
11.	126	1, 5, 78,187,244,275,298
11.	108	1, 5, 79,187,248,275,298
11.	102	1, 5, 79,187,244,275,298
11.	142	1, 5, 78,189,248,279,298
11.	136	1, 5, 78,189,244,279,298
11.	118	1, 5, 79,189,248,279,298
11.	112	1, 5, 79,189,244,279,298
11.	180	1, 5, 76,187,248,275,298
11.	174	1, 5, 76,187,244,275,298
11.	156	1, 5, 77,187,248,275,298
11.	150	1, 5, 77,187,244,275,298
11.	36	1, 7, 78,187,248,275,298
11.	30	1, 7, 78,187,244,275,298
11.	12	1, 7, 79,187,248,275,298
11.	6	1, 7, 79,187,244,275,298
11.	190	1, 5, 76,189,248,279,298
11.	184	1, 5, 76,189,244,279,298
11.	166	1, 5, 77,189,248,279,298
11.	160	1, 5, 77,189,244,279,298
11.	46	1, 7, 78,189,248,279,298
11.	40	1, 7, 78,189,244,279,298
11.	22	1, 7, 79,189,248,279,298
11.	16	1, 7, 79,189,244,279,298
11.	84	1, 7, 76,187,248,275,298
11.	78	1, 7, 76,187,244,275,298
11.	60	1, 7, 77,187,248,275,298
11.	54	1, 7, 77,187,244,275,298
11.	94	1, 7, 76,189,248,279,298
11.	88	1, 7, 76,189,244,279,298
11.	70	1, 7, 77,189,248,279,298
11.	64	1, 7, 77,189,244,279,298

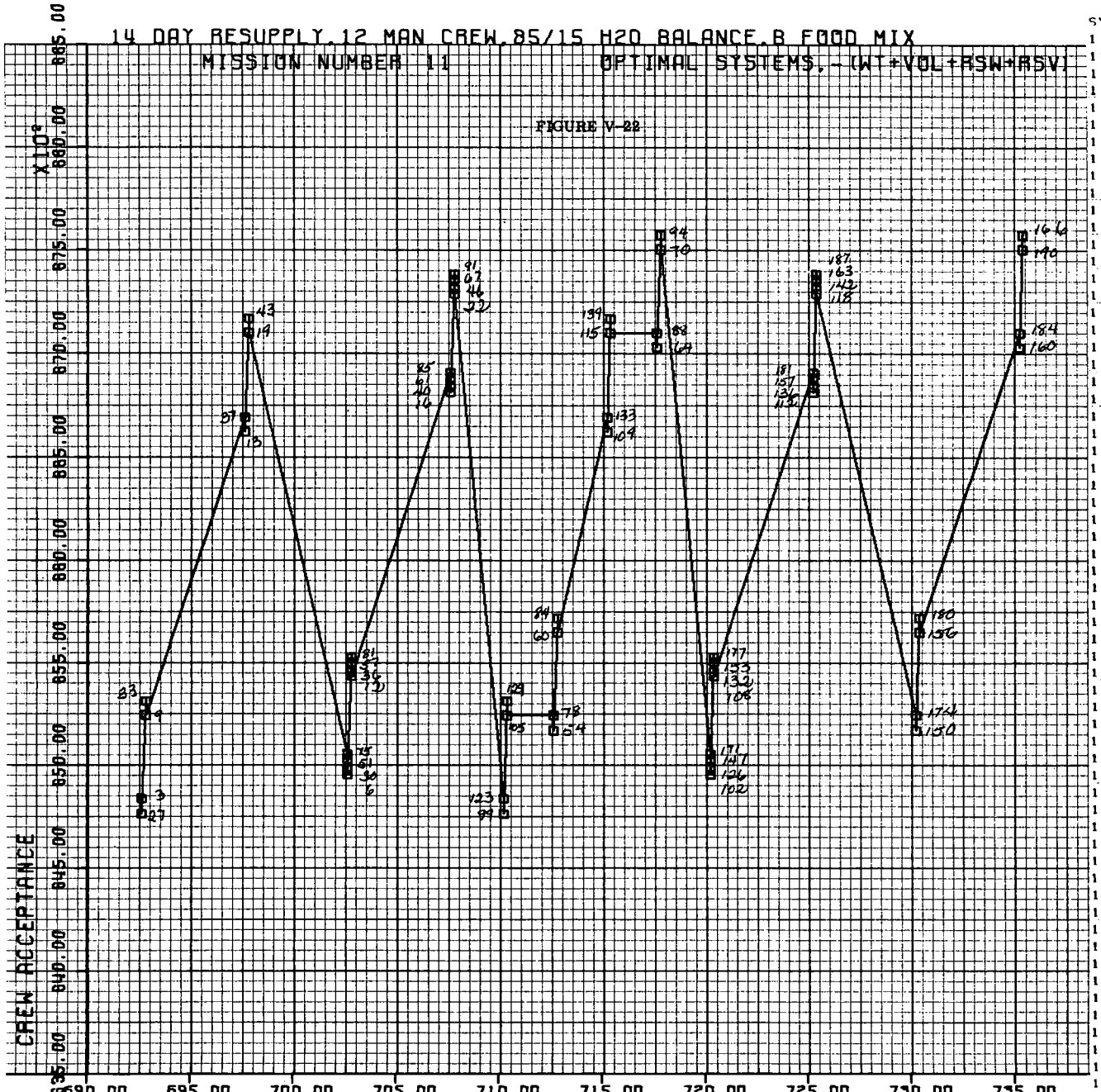


FIGURE V-22

SYSTEM	NR	COMPOSITION
11.	27	1. 7. 78,187,244,274,298
11.	3	1. 7. 79,187,244,274,298
11.	33	1. 7. 78,187,248,274,298
11.	9	1. 7. 79,187,248,274,298
11.	37	1. 7. 78,189,244,278,298
11.	13	1. 7. 79,189,244,278,298
11.	43	1. 7. 78,189,248,278,298
11.	19	1. 7. 79,189,248,278,298
11.	75	1. 7. 76,187,244,274,298
11.	51	1. 7. 77,187,244,274,298
11.	30	1. 7. 78,187,244,275,298
11.	6	1. 7. 79,187,244,275,298
11.	81	1. 7. 76,187,248,274,298
11.	57	1. 7. 77,187,248,274,298
11.	36	1. 7. 78,187,248,275,298
11.	12	1. 7. 79,187,248,275,298
11.	85	1. 7. 76,189,244,278,298
11.	61	1. 7. 77,189,244,278,298
11.	40	1. 7. 78,189,244,279,298
11.	15	1. 7. 79,189,244,279,298
11.	91	1. 7. 76,189,248,278,298
11.	67	1. 7. 77,189,248,278,298
11.	46	1. 7. 78,189,248,279,298
11.	22	1. 7. 79,189,248,279,298
11.	123	1. 5. 78,187,244,274,298
11.	99	1. 5. 79,187,244,274,298
11.	129	1. 5. 78,187,248,274,298
11.	105	1. 5. 79,187,248,274,298
11.	78	1. 7. 76,187,244,275,298
11.	54	1. 7. 77,187,244,275,298
11.	84	1. 7. 76,187,248,275,298
11.	60	1. 7. 77,187,248,275,298
11.	133	1. 5. 78,189,244,278,298
11.	109	1. 5. 79,189,244,278,298
11.	139	1. 5. 78,189,248,278,298
11.	115	1. 5. 79,189,248,278,298
11.	88	1. 7. 76,189,244,279,298
11.	64	1. 7. 77,189,244,279,298
11.	94	1. 7. 76,189,248,279,298
11.	70	1. 7. 77,189,248,279,298
11.	171	1. 5. 76,187,244,274,298
11.	147	1. 5. 77,187,244,274,298
11.	126	1. 5. 78,187,244,275,298
11.	102	1. 5. 79,187,244,275,298
11.	177	1. 5. 76,187,248,274,298
11.	153	1. 5. 77,187,248,274,298
11.	132	1. 5. 78,187,248,275,298
11.	108	1. 5. 79,187,248,275,298
11.	181	1. 5. 76,189,244,278,298
11.	157	1. 5. 77,189,244,278,298
11.	136	1. 5. 78,189,244,279,298
11.	112	1. 5. 79,189,244,279,298
11.	187	1. 5. 76,189,248,278,298
11.	163	1. 5. 77,189,248,278,298
11.	142	1. 5. 78,189,248,279,298
11.	118	1. 5. 79,189,248,279,298
11.	174	1. 5. 76,187,244,275,298
11.	150	1. 5. 77,187,244,275,298
11.	180	1. 5. 76,187,248,275,298
11.	156	1. 5. 77,187,248,275,298
11.	184	1. 5. 76,189,244,279,298
11.	160	1. 5. 77,189,244,279,298
11.	190	1. 5. 76,189,248,279,298
11.	166	1. 5. 77,189,248,279,298

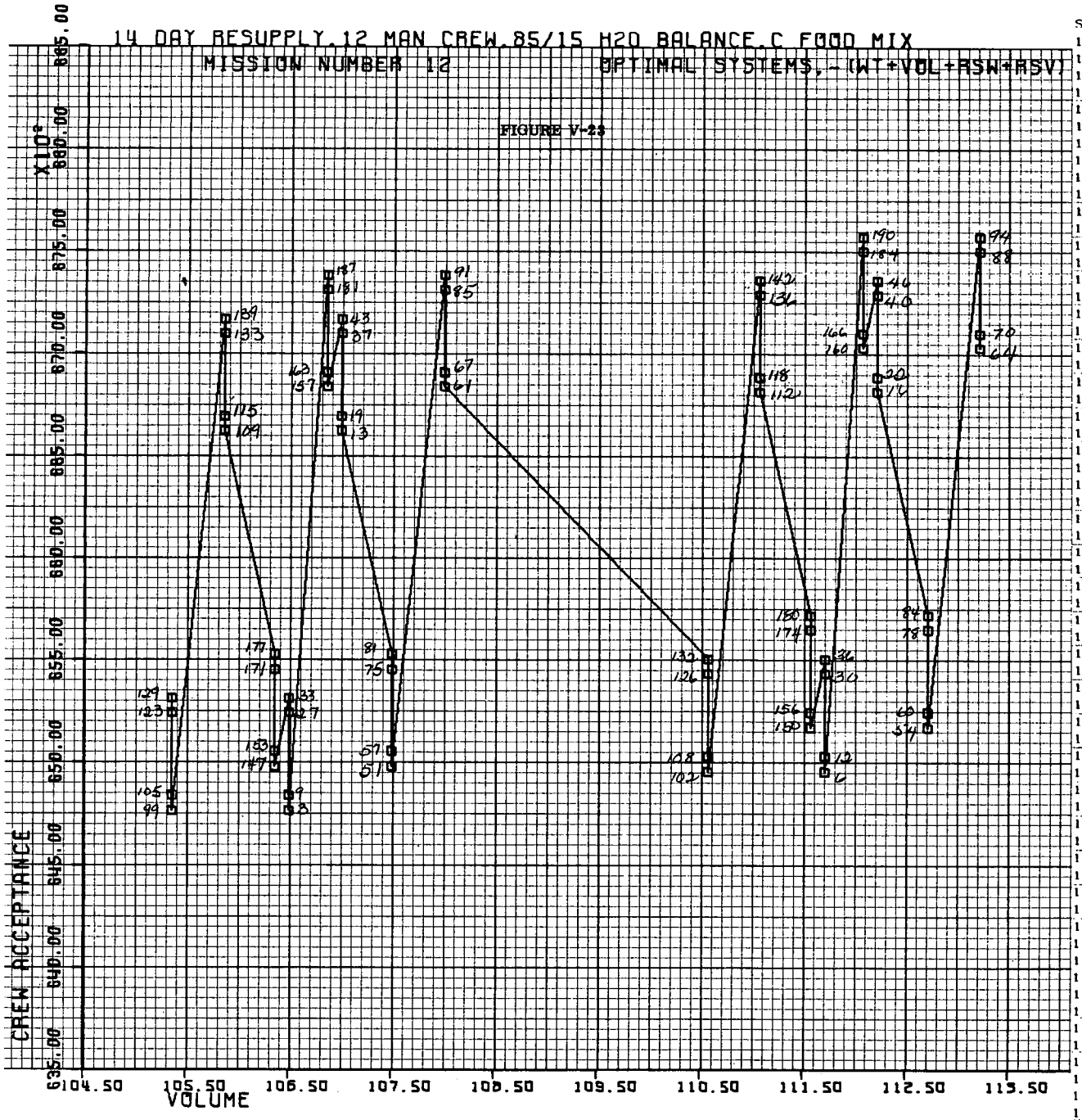


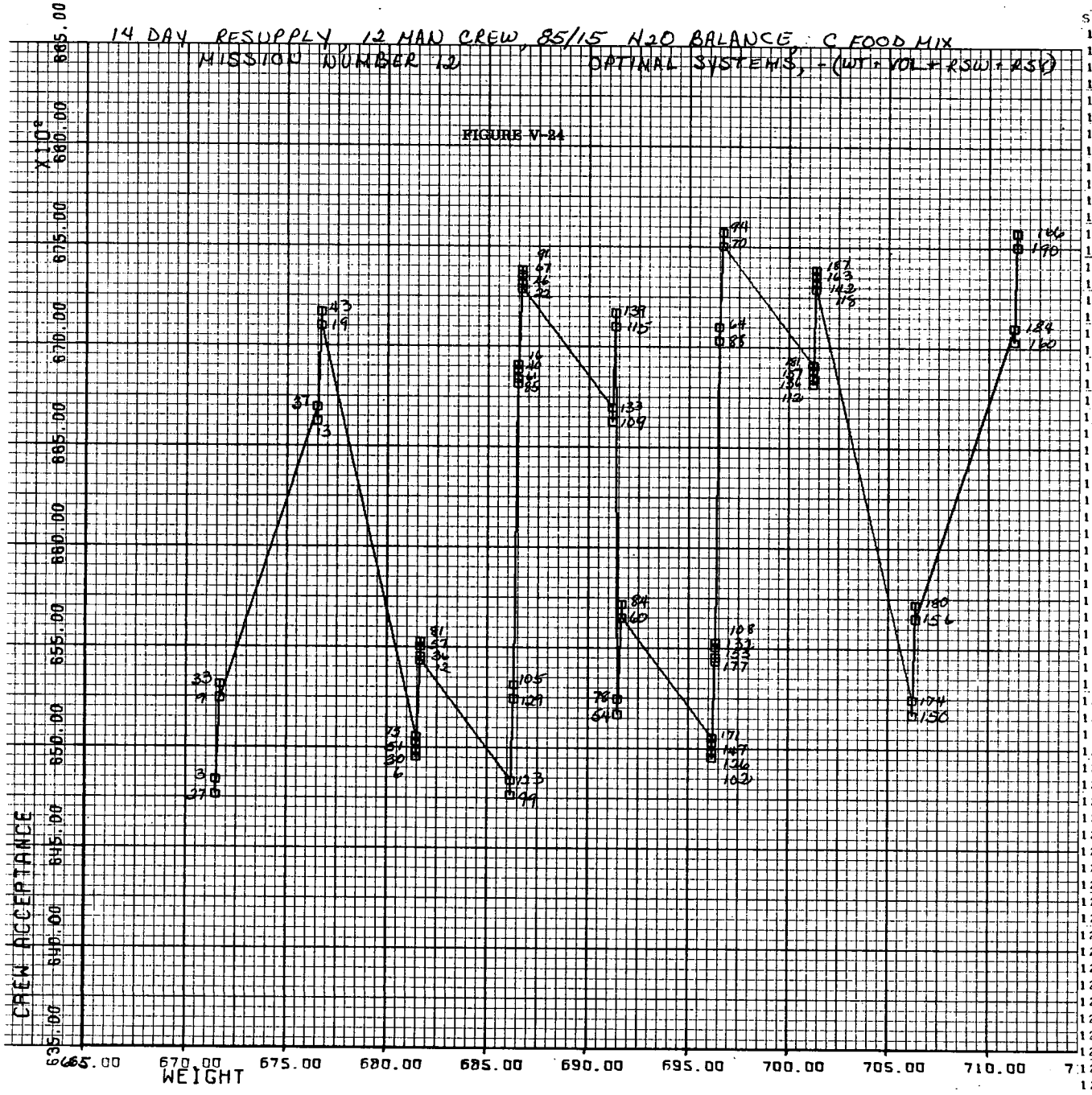
FIGURE V-23

SYSTEM	NR		COMPOSITION
12.	129	1.	5, 78,187,248,274,298
12.	123	1.	5, 78,187,244,274,298
12.	105	1.	5, 79,187,248,274,298
12.	99	1.	5, 79,187,244,274,298
12.	139	1.	5, 78,189,248,278,298
12.	133	1.	5, 78,189,244,278,298
12.	115	1.	5, 79,189,248,278,298
12.	109	1.	5, 79,189,244,278,298
12.	177	1.	5, 76,187,248,274,298
12.	171	1.	5, 76,187,244,274,298
12.	153	1.	5, 77,187,248,274,298
12.	147	1.	5, 77,187,244,274,298
12.	33	1.	7, 78,187,248,274,298
12.	27	1.	7, 78,187,244,274,298
12.	9	1.	7, 79,187,248,274,298
12.	3	1.	7, 79,187,244,274,298
12.	187	1.	5, 76,189,248,278,298
12.	181	1.	5, 76,189,244,278,298
12.	163	1.	5, 77,189,248,278,298
12.	157	1.	5, 77,189,244,278,298
12.	43	1.	7, 78,189,248,278,298
12.	37	1.	7, 78,189,244,278,298
12.	19	1.	7, 79,189,248,278,298
12.	13	1.	7, 79,189,244,278,298
12.	81	1.	7, 76,187,248,274,298
12.	75	1.	7, 76,187,244,274,298
12.	57	1.	7, 77,187,248,274,298
12.	51	1.	7, 77,187,244,274,298
12.	91	1.	7, 76,189,248,278,298
12.	85	1.	7, 76,189,244,278,298
12.	67	1.	7, 77,189,248,278,298
12.	61	1.	7, 77,189,244,278,298
12.	132	1.	5, 78,187,248,275,298
12.	126	1.	5, 78,187,244,275,298
12.	108	1.	5, 79,187,248,275,298
12.	102	1.	5, 79,187,244,275,298
12.	142	1.	5, 78,189,248,279,298
12.	136	1.	5, 78,189,244,279,298
12.	118	1.	5, 79,189,248,279,298
12.	112	1.	5, 79,189,244,279,298
12.	180	1.	5, 76,187,248,275,298
12.	174	1.	5, 76,187,244,275,298
12.	156	1.	5, 77,187,248,275,298
12.	150	1.	5, 77,187,244,275,298
12.	36	1.	7, 78,187,248,275,298
12.	30	1.	7, 78,187,244,275,298
12.	12	1.	7, 79,187,248,275,298
12.	6	1.	7, 79,187,244,275,298
12.	190	1.	5, 76,189,248,279,298
12.	184	1.	5, 76,189,244,279,298
12.	166	1.	5, 77,189,248,279,298
12.	160	1.	5, 77,189,244,279,298
12.	46	1.	7, 78,189,248,279,298
12.	40	1.	7, 78,189,244,279,298
12.	22	1.	7, 79,189,248,279,298
12.	16	1.	7, 79,189,244,279,298
12.	84	1.	7, 76,187,248,275,298
12.	78	1.	7, 76,187,244,275,298
12.	60	1.	7, 77,187,248,275,298
12.	54	1.	7, 77,187,244,275,298
12.	94	1.	7, 76,189,248,279,298
12.	88	1.	7, 76,189,244,279,298
12.	70	1.	7, 77,189,248,279,298
12.	64	1.	7, 77,189,244,279,298

14 DAY RESUPPLY 12 MAN CREW, 85/15 H_2O BALANCE, C FOOD MIX

MISSION NUMBER 12 OPTIMAL SYSTEMS, - (WT + VOL + RSW + ASV)

FIGURE V-24



SYSTEM	NP	COMPOSITION
12.	27	1. 7. 78.187.244.274.298
12.	3	1. 7. 79.187.244.274.298
12.	33	1. 7. 78.187.248.274.298
12.	9	1. 7. 79.187.248.274.298
12.	37	1. 7. 78.189.244.278.298
12.	13	1. 7. 79.189.244.278.298
12.	43	1. 7. 78.189.248.279.298
12.	19	1. 7. 79.189.248.278.298
12.	75	1. 7. 76.187.244.274.298
12.	51	1. 7. 77.187.244.274.298
12.	30	1. 7. 78.187.244.275.298
12.	6	1. 7. 79.187.244.275.298
12.	81	1. 7. 76.187.248.274.298
12.	57	1. 7. 77.187.248.274.298
12.	36	1. 7. 78.187.248.275.298
12.	12	1. 7. 79.187.248.275.298
12.	123	1. 5. 78.187.244.274.298
12.	99	1. 5. 79.187.244.274.298
12.	129	1. 5. 78.187.248.274.298
12.	105	1. 5. 79.187.248.274.298
12.	85	1. 7. 76.189.244.278.298
12.	61	1. 7. 77.189.244.278.298
12.	40	1. 7. 78.189.244.279.298
12.	16	1. 7. 79.189.244.279.298
12.	91	1. 7. 76.189.248.278.298
12.	67	1. 7. 77.189.248.278.298
12.	46	1. 7. 78.189.248.279.298
12.	22	1. 7. 79.189.248.279.298
12.	133	1. 5. 78.189.244.278.298
12.	109	1. 5. 79.189.244.278.298
12.	139	1. 5. 78.189.248.278.298
12.	115	1. 5. 79.189.248.278.298
12.	78	1. 7. 76.187.244.275.298
12.	54	1. 7. 77.187.244.275.298
12.	84	1. 7. 76.187.248.275.298
12.	60	1. 7. 77.187.248.275.298
12.	171	1. 5. 76.187.244.274.298
12.	147	1. 5. 77.187.244.274.298
12.	126	1. 5. 78.187.244.275.298
12.	102	1. 5. 79.187.244.275.298
12.	177	1. 5. 76.187.248.274.298
12.	153	1. 5. 77.187.248.274.298
12.	132	1. 5. 78.187.248.275.298
12.	108	1. 5. 79.187.248.275.298
12.	88	1. 7. 76.189.244.279.298
12.	64	1. 7. 77.189.244.279.298
12.	94	1. 7. 76.189.248.279.298
12.	70	1. 7. 77.189.248.279.298
12.	181	1. 5. 76.189.244.278.298
12.	157	1. 5. 77.189.244.278.298
12.	136	1. 5. 78.189.244.279.298
12.	112	1. 5. 79.189.244.279.298
12.	187	1. 5. 76.189.248.278.298
12.	163	1. 5. 77.189.248.278.298
12.	142	1. 5. 78.189.248.279.298
12.	118	1. 5. 79.189.248.279.298
12.	174	1. 5. 76.187.244.275.298
12.	150	1. 5. 77.187.244.275.298
12.	180	1. 5. 76.187.248.275.298
12.	156	1. 5. 77.187.248.275.298
12.	184	1. 5. 76.189.244.279.298
12.	160	1. 5. 77.189.244.279.298
12.	190	1. 5. 76.189.248.279.298
12.	166	1. 5. 77.189.248.279.298

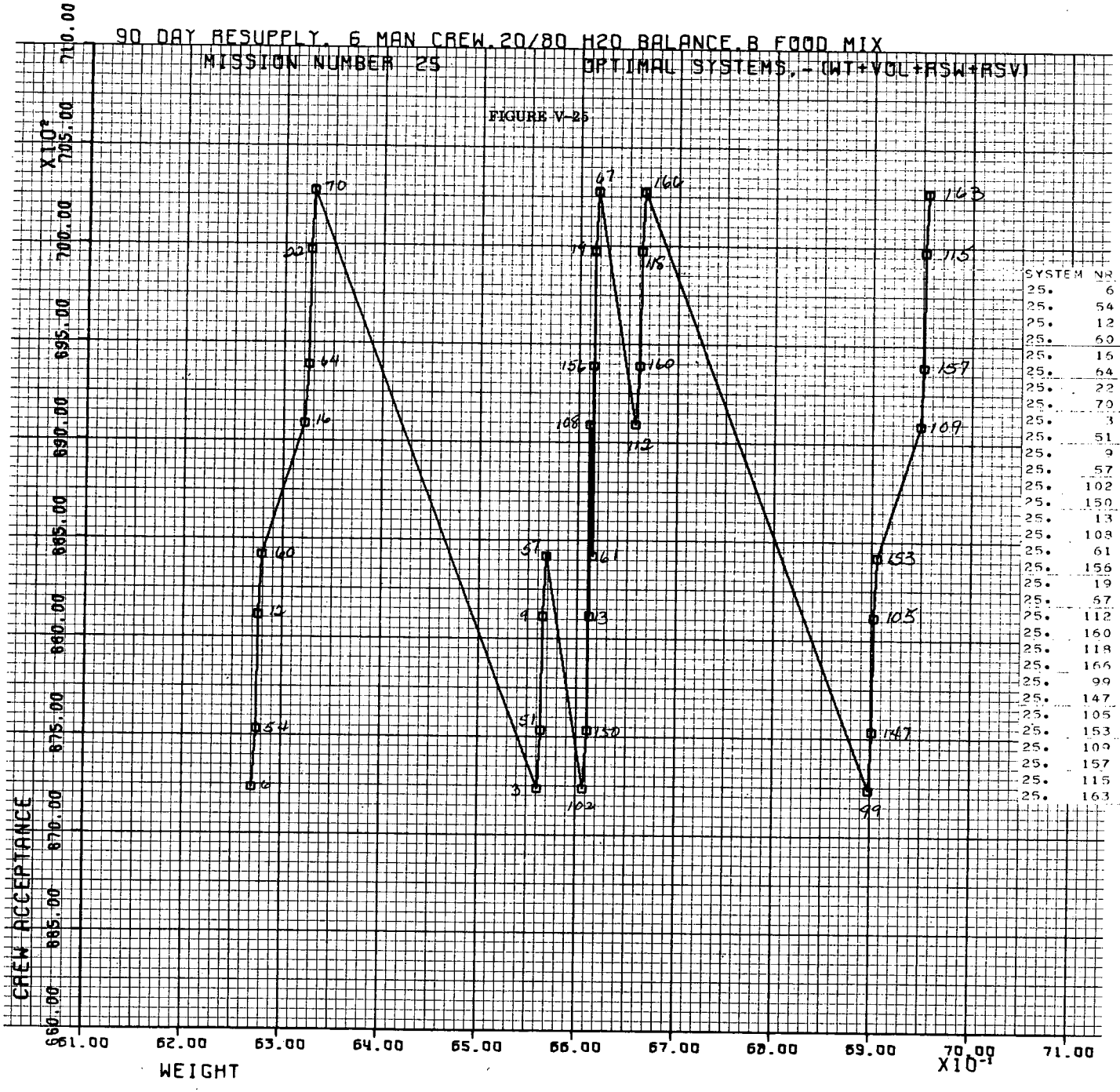


FIGURE V-25

SYSTEM	NR	COMPOSITION
25.	6	1, 15, 78,187,244,274,298
25.	54	1, 15, 79,187,244,274,298
25.	12	1, 15, 78,187,238,274,298
25.	60	1, 15, 79,187,238,274,298
25.	16	1, 15, 78,189,244,278,298
25.	64	1, 15, 79,189,244,278,298
25.	22	1, 15, 78,189,238,278,298
25.	70	1, 15, 79,189,238,278,298
25.	3	1, 15, 78,187,244,280,298
25.	51	1, 15, 79,187,244,280,298
25.	9	1, 15, 78,187,238,280,298
25.	57	1, 15, 79,187,238,280,298
25.	102	1, 13, 78,187,244,274,298
25.	150	1, 13, 79,187,244,274,298
25.	13	1, 15, 78,189,244,284,298
25.	108	1, 13, 78,187,238,274,298
25.	61	1, 15, 79,189,244,284,298
25.	156	1, 13, 79,187,238,274,298
25.	19	1, 15, 78,189,238,284,298
25.	67	1, 15, 79,189,238,284,298
25.	112	1, 13, 78,189,244,278,298
25.	160	1, 13, 79,189,244,278,298
25.	118	1, 13, 78,189,238,278,298
25.	166	1, 13, 79,189,238,278,298
25.	99	1, 13, 78,187,244,280,298
25.	147	1, 13, 79,187,244,280,298
25.	105	1, 13, 78,187,238,280,298
25.	153	1, 13, 79,187,238,280,298
25.	109	1, 13, 78,189,244,284,298
25.	157	1, 13, 79,189,244,284,298
25.	115	1, 13, 78,189,238,284,298
25.	163	1, 13, 79,189,238,284,298

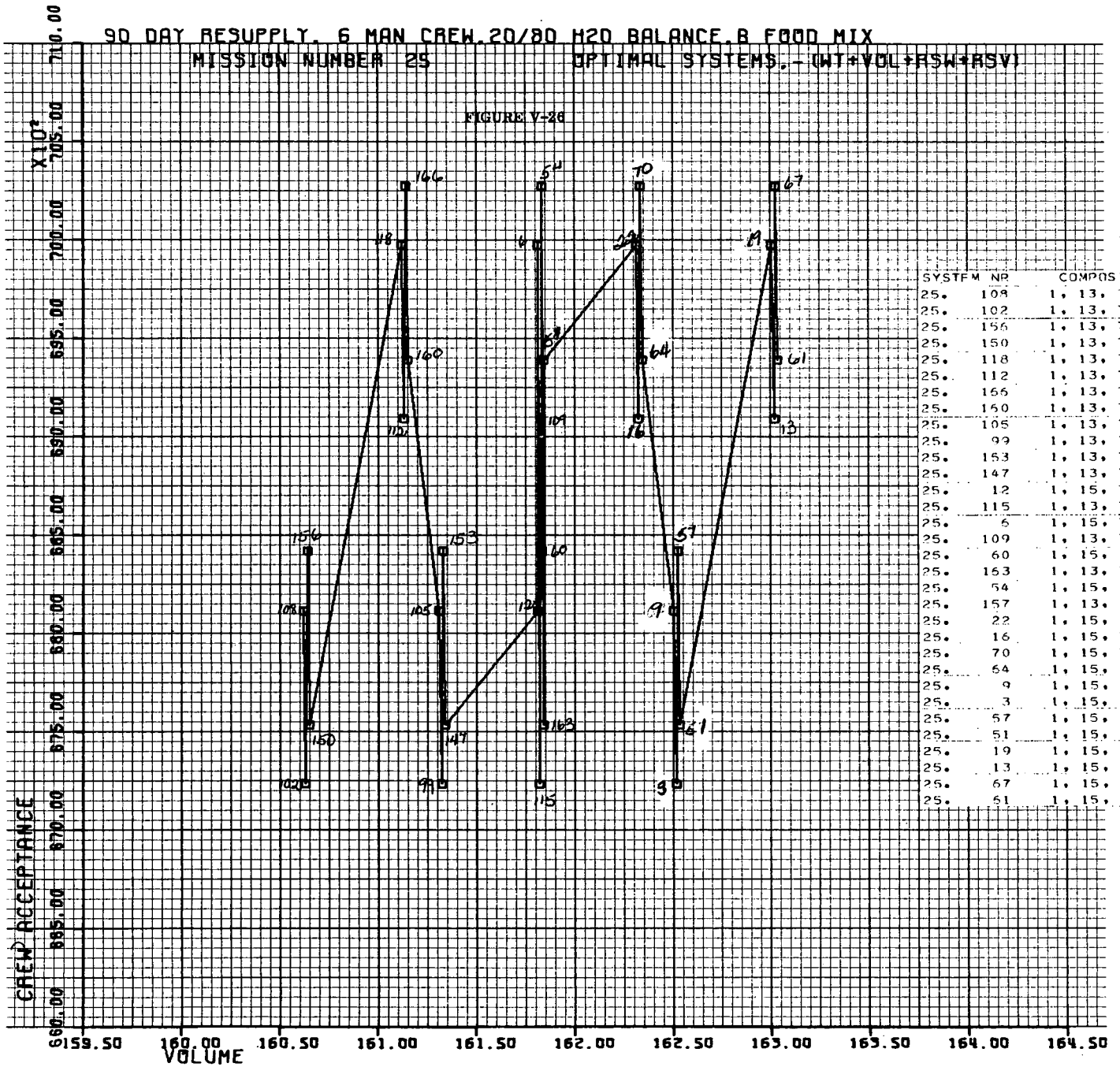


FIGURE V-26

SYSTEM	NR	COMPOSITION
25.	108	1, 13, 78,187,238,274,298
25.	102	1, 13, 78,187,244,274,298
25.	156	1, 13, 79,187,238,274,298
25.	150	1, 13, 79,187,244,274,298
25.	118	1, 13, 78,189,238,278,298
25.	112	1, 13, 78,189,244,278,298
25.	166	1, 13, 79,189,238,278,298
25.	160	1, 13, 79,189,244,278,298
25.	105	1, 13, 78,187,238,280,298
25.	99	1, 13, 78,187,244,280,298
25.	153	1, 13, 79,187,238,280,298
25.	147	1, 13, 79,187,244,280,298
25.	12	1, 15, 78,187,238,274,298
25.	115	1, 13, 78,189,238,284,298
25.	6	1, 15, 78,187,244,274,298
25.	109	1, 13, 78,189,244,284,298
25.	60	1, 15, 79,187,238,274,298
25.	163	1, 13, 79,189,238,284,298
25.	54	1, 15, 79,187,244,274,298
25.	157	1, 13, 79,189,244,284,298
25.	22	1, 15, 78,189,238,278,298
25.	16	1, 15, 78,189,244,278,298
25.	70	1, 15, 79,189,238,278,298
25.	64	1, 15, 79,189,244,278,298
25.	9	1, 15, 78,187,238,280,298
25.	3	1, 15, 78,187,244,280,298
25.	57	1, 15, 79,187,238,280,298
25.	51	1, 15, 79,187,244,280,298
25.	19	1, 15, 78,189,238,284,298
25.	13	1, 15, 78,189,244,284,298
25.	67	1, 15, 79,189,238,284,298
25.	61	1, 15, 79,189,244,284,298

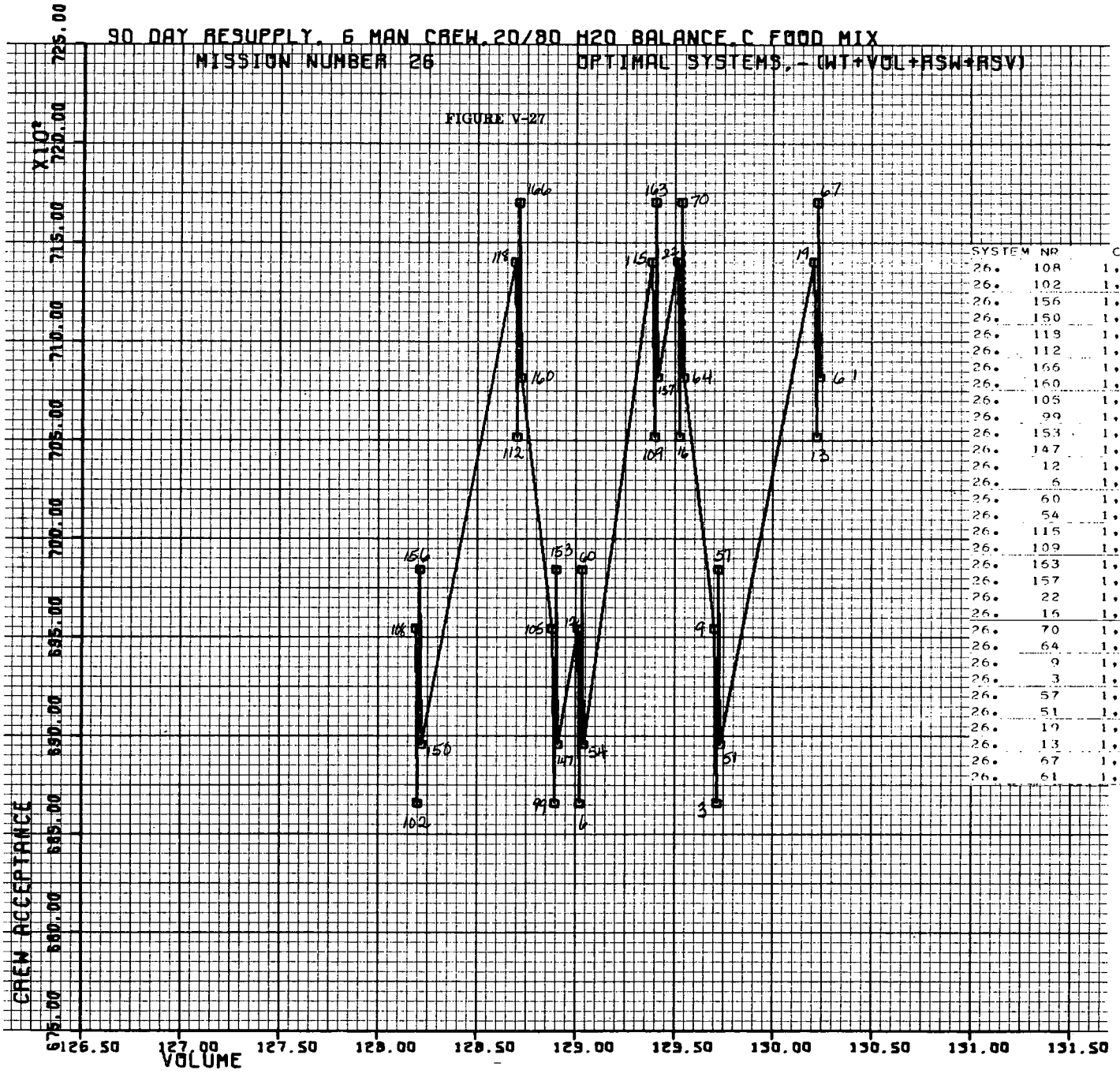


FIGURE V-27

SYSTEM NR		COMPOSITION
26.	108	1. 5. 78,187,238,274,298
26.	102	1. 5. 78,187,244,274,298
26.	156	1. 5. 79,187,238,274,298
26.	150	1. 5. 79,187,244,274,298
26.	119	1. 5. 78,189,238,278,298
26.	112	1. 5. 78,189,244,278,298
26.	166	1. 5. 79,189,238,278,298
26.	160	1. 5. 79,189,244,278,298
26.	105	1. 5. 78,187,238,280,298
26.	99	1. 5. 78,187,244,280,298
26.	153	1. 5. 79,187,238,280,298
26.	147	1. 5. 79,187,244,280,298
26.	12	1. 7. 78,187,238,274,298
26.	6	1. 7. 78,187,244,274,298
26.	60	1. 7. 79,187,238,274,298
26.	54	1. 7. 79,187,244,274,298
26.	115	1. 5. 78,189,238,284,298
26.	109	1. 5. 78,189,244,284,298
26.	163	1. 5. 79,189,238,284,298
26.	157	1. 5. 79,189,244,284,298
26.	22	1. 7. 78,189,238,278,298
26.	16	1. 7. 78,189,244,278,298
26.	70	1. 7. 79,189,238,278,298
26.	64	1. 7. 79,189,244,278,298
26.	9	1. 7. 78,187,238,280,298
26.	3	1. 7. 78,187,244,280,298
26.	57	1. 7. 79,187,238,280,298
26.	51	1. 7. 79,187,244,280,298
26.	19	1. 7. 78,189,238,284,298
26.	13	1. 7. 78,189,244,284,298
26.	67	1. 7. 79,189,238,284,298
26.	61	1. 7. 79,189,244,284,298

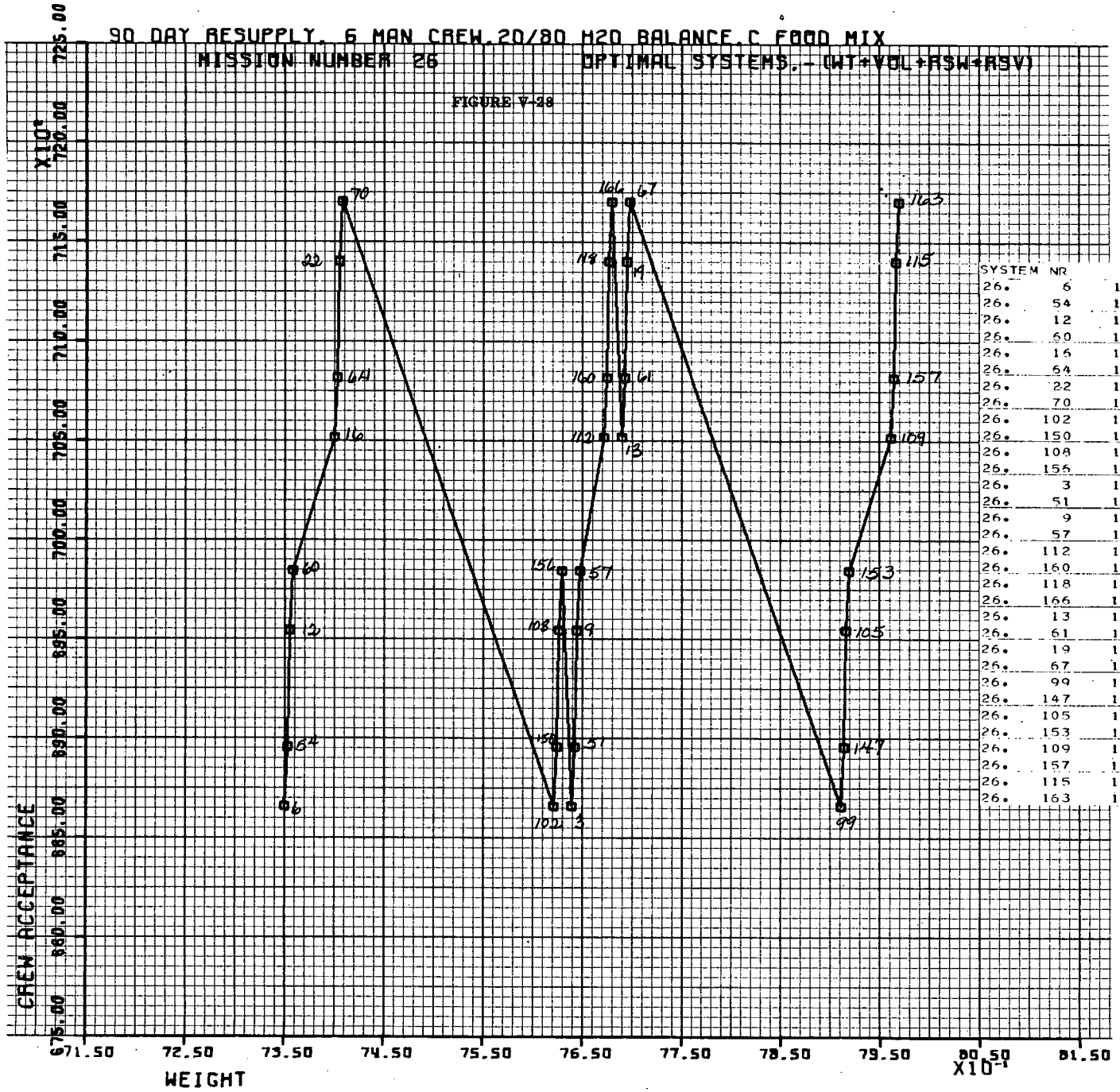


FIGURE V-28

SYSTEM NR		COMPOSITION
26.	6	1. 7. 78,187,244,274,298
26.	54	1. 7. 79,187,244,274,298
26.	12	1. 7. 78,187,238,274,298
26.	60	1. 7. 79,187,238,274,298
26.	16	1. 7. 78,189,244,278,298
26.	64	1. 7. 79,189,244,278,298
26.	22	1. 7. 78,189,238,278,298
26.	70	1. 7. 79,189,238,278,298
26.	102	1. 5. 78,187,244,274,298
26.	150	1. 5. 79,187,244,274,298
26.	108	1. 5. 78,187,238,274,298
26.	156	1. 5. 79,187,238,274,298
26.	3	1. 7. 78,187,244,280,298
26.	51	1. 7. 79,187,244,280,298
26.	9	1. 7. 78,187,238,280,298
26.	57	1. 7. 79,187,238,280,298
26.	112	1. 5. 78,189,244,278,298
26.	160	1. 5. 79,189,244,278,298
26.	118	1. 5. 78,189,238,278,298
26.	166	1. 5. 79,189,238,278,298
26.	13	1. 7. 78,189,244,284,298
26.	61	1. 7. 79,189,244,284,298
26.	19	1. 7. 78,189,238,284,298
26.	67	1. 7. 79,189,238,284,298
26.	99	1. 5. 78,187,244,280,298
26.	147	1. 5. 79,187,244,280,298
26.	105	1. 5. 78,187,238,280,298
26.	153	1. 5. 79,187,238,280,298
26.	109	1. 5. 78,189,244,284,298
26.	157	1. 5. 79,189,244,284,298
26.	115	1. 5. 78,189,238,284,298
26.	163	1. 5. 79,189,238,284,298

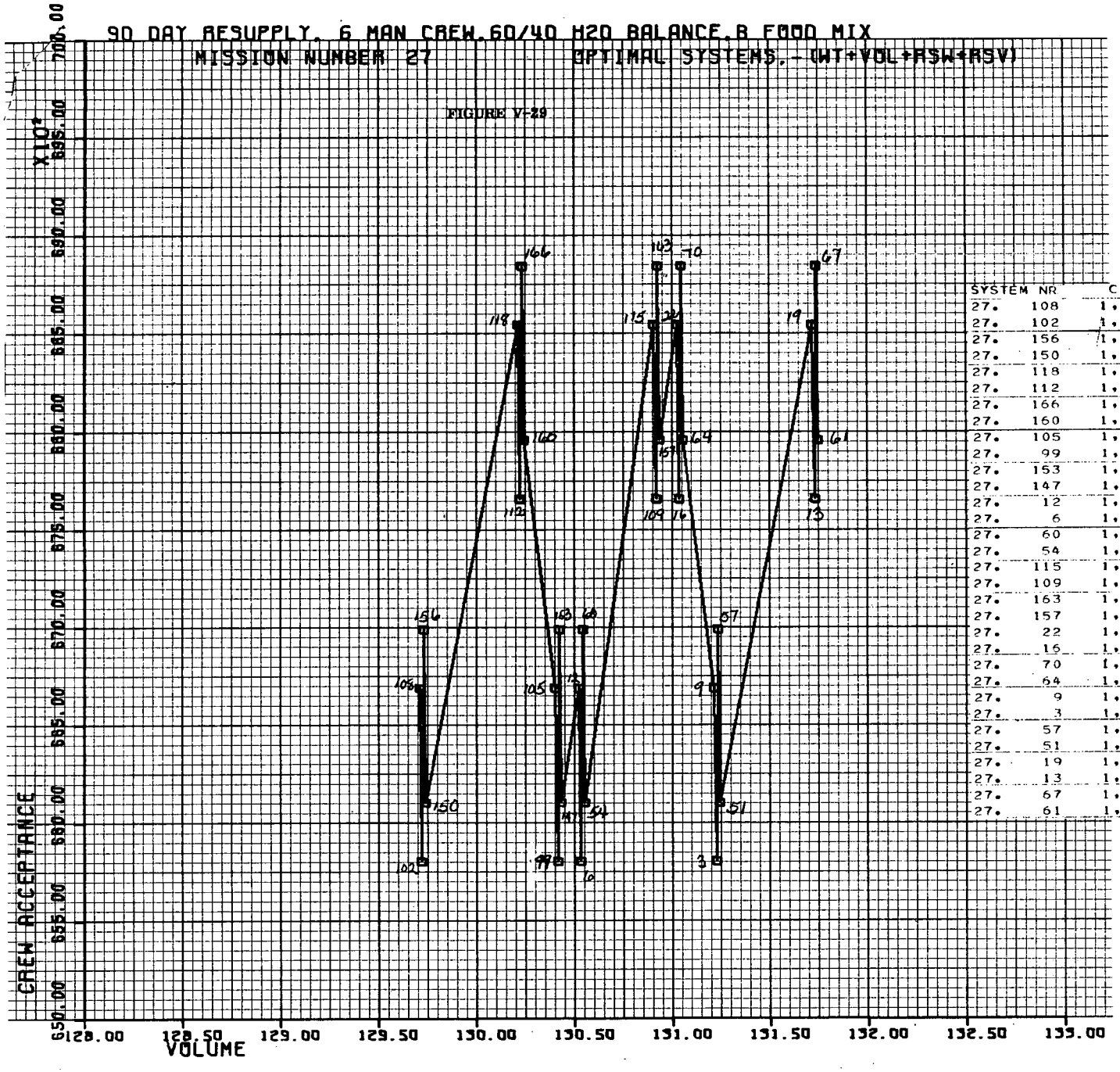


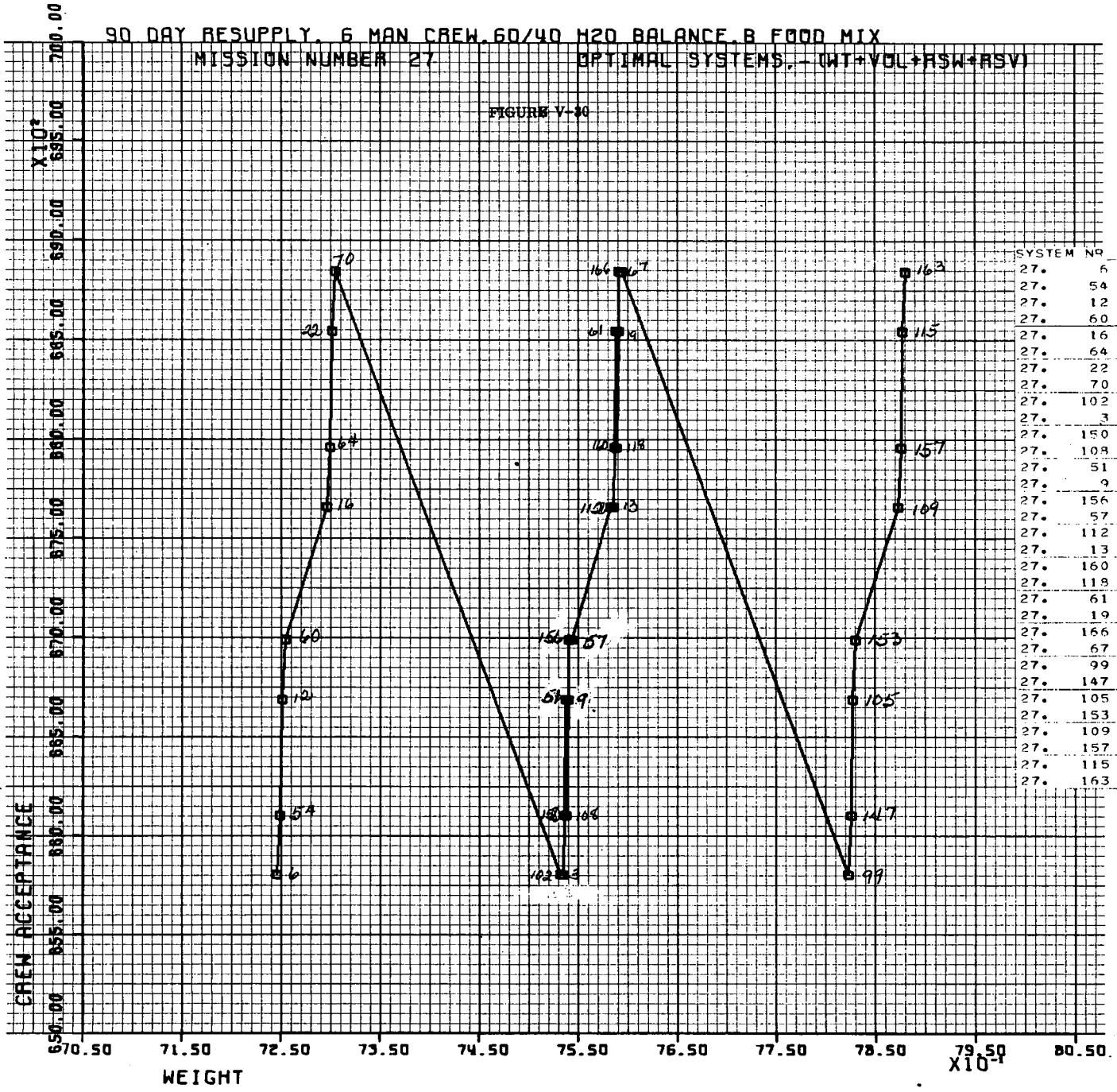
FIGURE V-29

SYSTEM NR		COMPOSITION
27.	108	1. 5. 78,187,238,274,298
27.	102	1. 5. 78,187,244,274,298
27.	156	1. 5. 79,187,238,274,298
27.	150	1. 5. 79,187,244,274,298
27.	118	1. 5. 78,189,238,278,298
27.	112	1. 5. 78,189,244,278,298
27.	166	1. 5. 79,189,238,278,298
27.	160	1. 5. 79,189,244,278,298
27.	105	1. 5. 78,187,238,280,298
27.	99	1. 5. 78,187,244,280,298
27.	153	1. 5. 79,187,238,280,298
27.	147	1. 5. 79,187,244,280,298
27.	12	1. 7. 78,187,238,274,298
27.	6	1. 7. 78,187,244,274,298
27.	60	1. 7. 79,187,238,274,298
27.	54	1. 7. 79,187,244,274,298
27.	115	1. 5. 78,189,238,284,298
27.	109	1. 5. 78,189,244,284,298
27.	163	1. 5. 79,189,238,284,298
27.	157	1. 5. 79,189,244,284,298
27.	22	1. 7. 78,189,238,278,298
27.	16	1. 7. 78,189,244,278,298
27.	70	1. 7. 79,189,238,278,298
27.	64	1. 7. 79,189,244,278,298
27.	9	1. 7. 78,187,238,280,298
27.	3	1. 7. 78,187,244,280,298
27.	57	1. 7. 79,187,238,280,298
27.	51	1. 7. 79,187,244,280,298
27.	19	1. 7. 78,189,238,284,298
27.	13	1. 7. 78,189,244,284,298
27.	67	1. 7. 79,189,238,284,298
27.	61	1. 7. 79,189,244,284,298

90 DAY RESUPPLY, 6 MAN CREW, 60/40 H2O BALANCE, B FOOD MIX

MISSION NUMBER 27 OPTIMAL SYSTEMS, - (WT+VOL+RSW+RSV)

FIGURE V-30



SYSTEM NO		COMPOSITION	
27.	6	1.	7. 78,187,244,274,298
27.	54	1.	7. 79,187,244,274,298
27.	12	1.	7. 78,187,238,274,298
27.	60	1.	7. 79,187,238,274,298
27.	16	1.	7. 78,189,244,278,298
27.	64	1.	7. 79,189,244,278,298
27.	22	1.	7. 78,189,238,278,298
27.	70	1.	7. 79,189,238,278,298
27.	102	1.	5. 78,187,244,274,298
27.	3	1.	7. 78,187,244,280,298
27.	150	1.	5. 79,187,244,274,298
27.	108	1.	5. 78,187,238,274,298
27.	51	1.	7. 79,187,244,280,298
27.	9	1.	7. 78,187,238,280,298
27.	156	1.	5. 79,187,238,274,298
27.	57	1.	7. 79,187,238,280,298
27.	112	1.	5. 78,189,244,278,298
27.	13	1.	7. 78,189,244,284,298
27.	160	1.	5. 79,189,244,278,298
27.	118	1.	5. 78,189,238,278,298
27.	61	1.	7. 79,189,244,284,298
27.	19	1.	7. 78,189,238,284,298
27.	166	1.	5. 79,189,238,278,298
27.	67	1.	7. 79,189,238,284,298
27.	99	1.	5. 78,187,244,280,298
27.	147	1.	5. 79,187,244,280,298
27.	105	1.	5. 78,187,238,280,298
27.	153	1.	5. 79,187,238,280,298
27.	109	1.	5. 78,189,244,284,298
27.	157	1.	5. 79,189,244,284,298
27.	115	1.	5. 78,189,238,284,298
27.	163	1.	5. 79,189,238,284,298

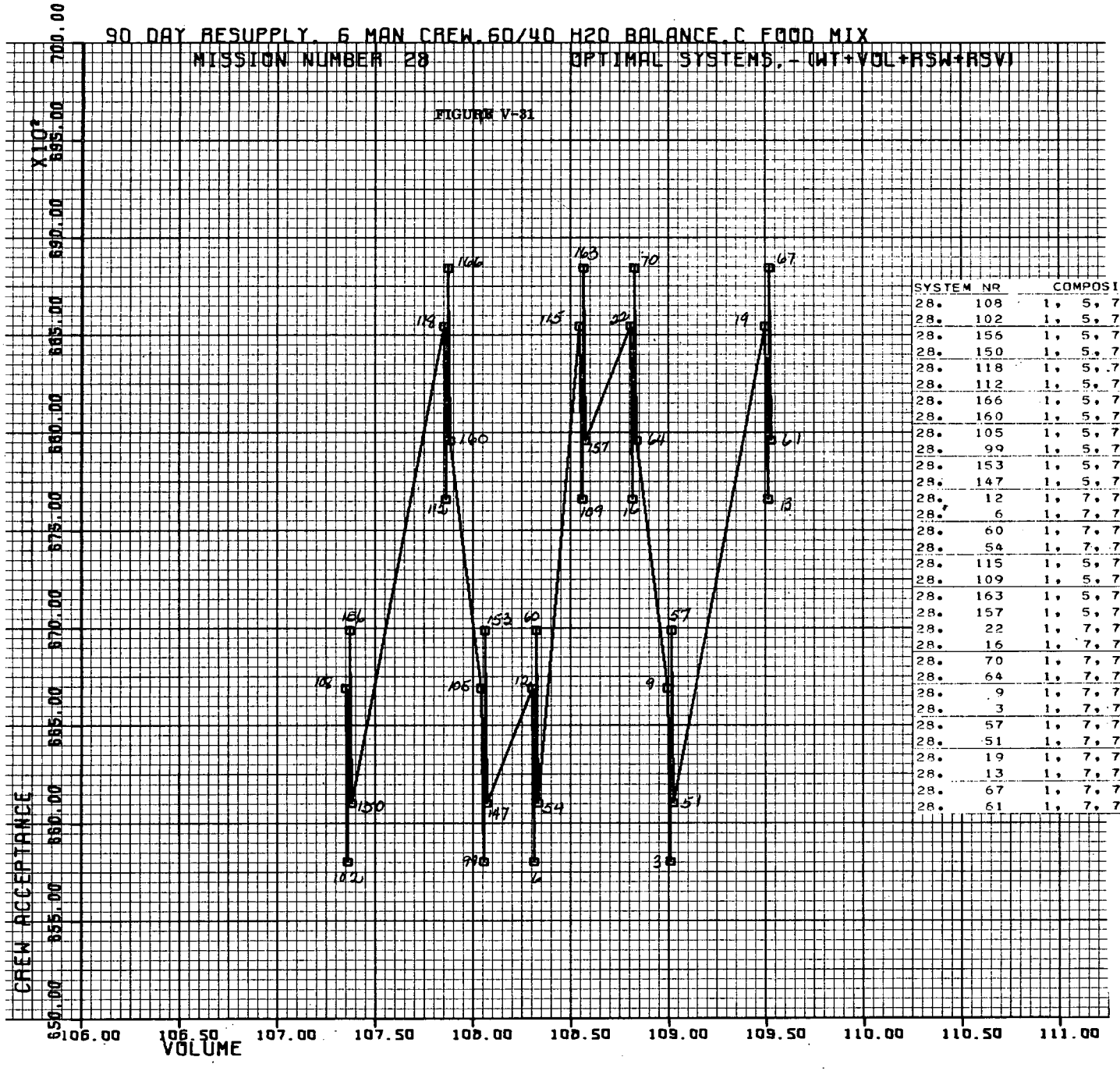


FIGURE V-31

SYSTEM NR		COMPOSITION
28.	108	1. 5. 78,187,238,274,298
28.	102	1. 5. 78,187,244,274,298
28.	156	1. 5. 79,187,238,274,298
28.	150	1. 5. 79,187,244,274,298
28.	118	1. 5. 78,189,238,278,298
28.	112	1. 5. 78,189,244,278,298
28.	166	1. 5. 79,189,238,278,298
28.	160	1. 5. 79,189,244,278,298
28.	105	1. 5. 78,187,238,280,298
28.	99	1. 5. 78,187,244,280,298
28.	153	1. 5. 79,187,238,280,298
28.	147	1. 5. 79,187,244,280,298
28.	12	1. 7. 78,187,238,274,298
28.	6	1. 7. 78,187,244,274,298
28.	60	1. 7. 79,187,238,274,298
28.	54	1. 7. 79,187,244,274,298
28.	115	1. 5. 78,189,238,284,298
28.	109	1. 5. 78,189,244,284,298
28.	163	1. 5. 79,189,238,284,298
28.	157	1. 5. 79,189,244,284,298
28.	22	1. 7. 78,189,238,278,298
28.	16	1. 7. 78,189,244,278,298
28.	70	1. 7. 79,189,238,278,298
28.	64	1. 7. 79,189,244,278,298
28.	9	1. 7. 78,187,238,280,298
28.	3	1. 7. 78,187,244,280,298
28.	57	1. 7. 79,187,238,280,298
28.	51	1. 7. 79,187,244,280,298
28.	19	1. 7. 78,189,238,284,298
28.	13	1. 7. 78,189,244,284,298
28.	67	1. 7. 79,189,238,284,298
28.	61	1. 7. 79,189,244,284,298

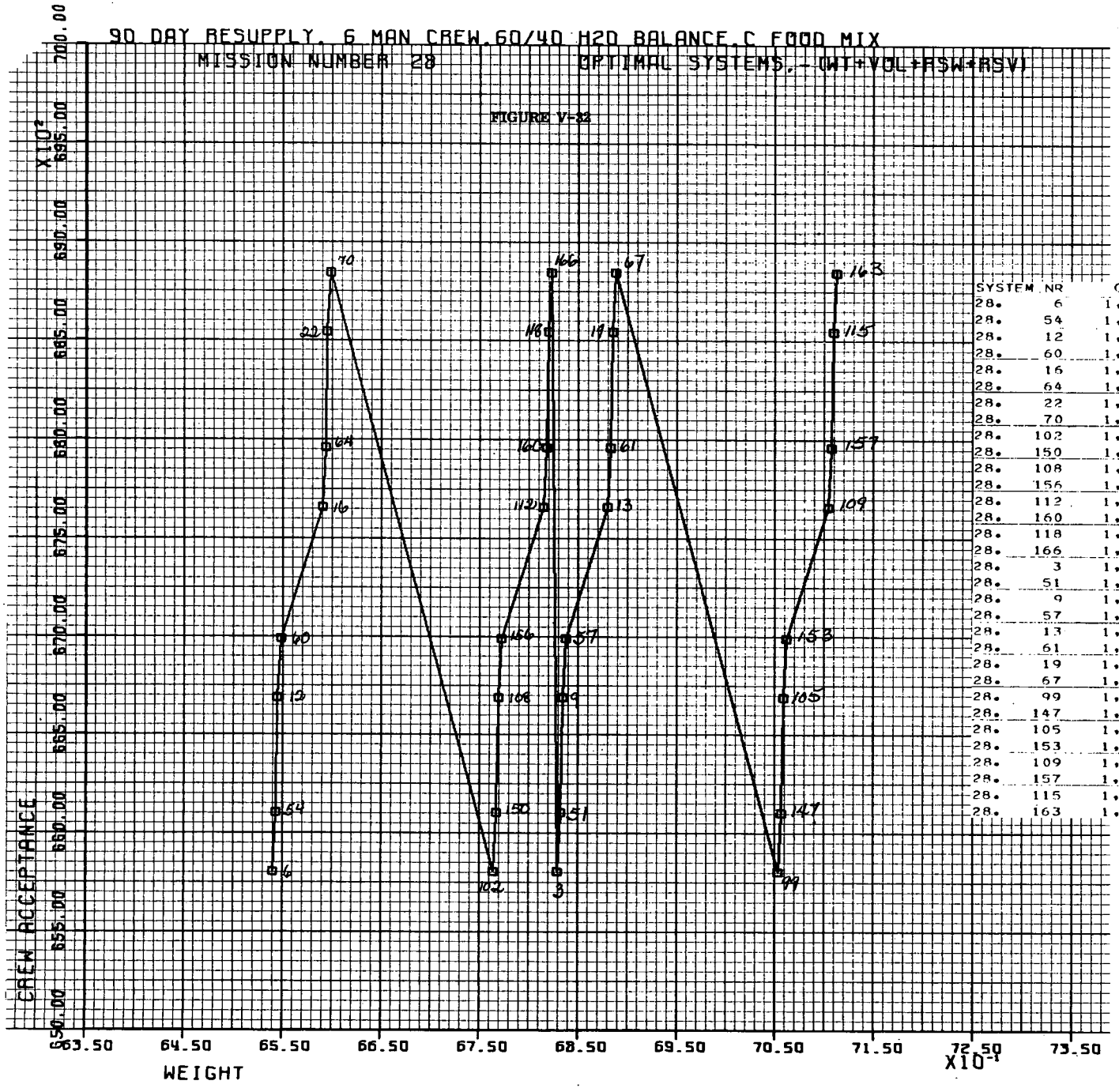


FIGURE V-82

SYSTEM NR		COMPOSITION
28.	6	1, 7, 78,187,244,274,298
28.	54	1, 7, 79,187,244,274,298
28.	12	1, 7, 78,187,238,274,298
28.	60	1, 7, 79,187,238,274,298
28.	16	1, 7, 78,189,244,278,298
28.	64	1, 7, 79,189,244,278,298
28.	22	1, 7, 78,189,238,278,298
28.	70	1, 7, 79,189,238,278,298
28.	102	1, 5, 78,187,244,274,298
28.	150	1, 5, 79,187,244,274,298
28.	108	1, 5, 78,187,238,274,298
28.	156	1, 5, 79,187,238,274,298
28.	112	1, 5, 78,189,244,278,298
28.	160	1, 5, 79,189,244,278,298
28.	118	1, 5, 78,189,238,278,298
28.	166	1, 5, 79,189,238,278,298
28.	3	1, 7, 78,187,244,280,298
28.	51	1, 7, 79,187,244,280,298
28.	9	1, 7, 78,187,238,280,298
28.	57	1, 7, 79,187,238,280,298
28.	13	1, 7, 78,189,244,284,298
28.	61	1, 7, 79,189,244,284,298
28.	19	1, 7, 78,189,238,284,298
28.	67	1, 7, 79,189,238,284,298
28.	99	1, 5, 78,187,244,280,298
28.	147	1, 5, 79,187,244,280,298
28.	105	1, 5, 78,187,238,280,298
28.	153	1, 5, 79,187,238,280,298
28.	109	1, 5, 78,189,244,284,298
28.	157	1, 5, 79,189,244,284,298
28.	115	1, 5, 78,189,238,284,298
28.	163	1, 5, 79,189,238,284,298

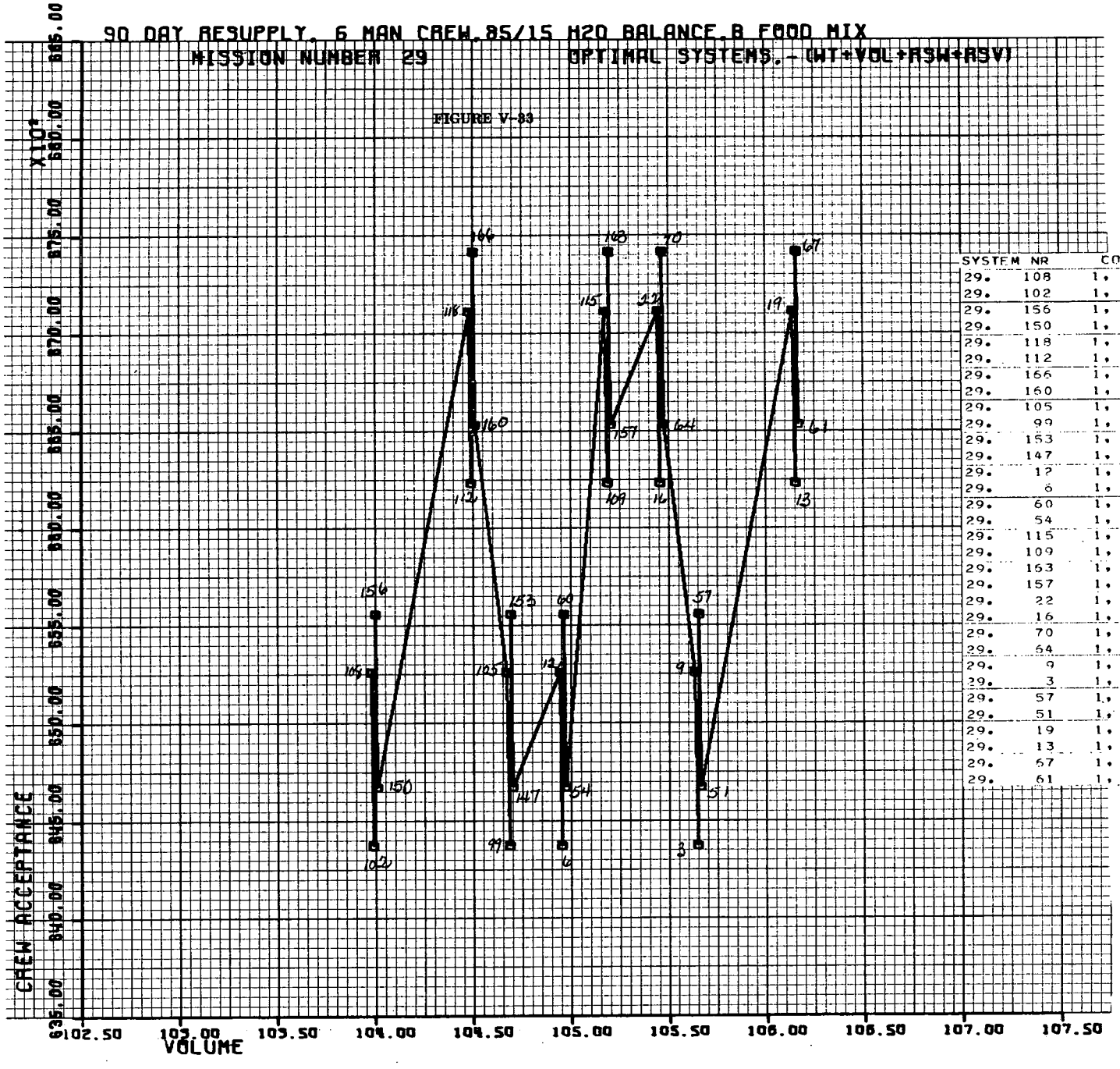
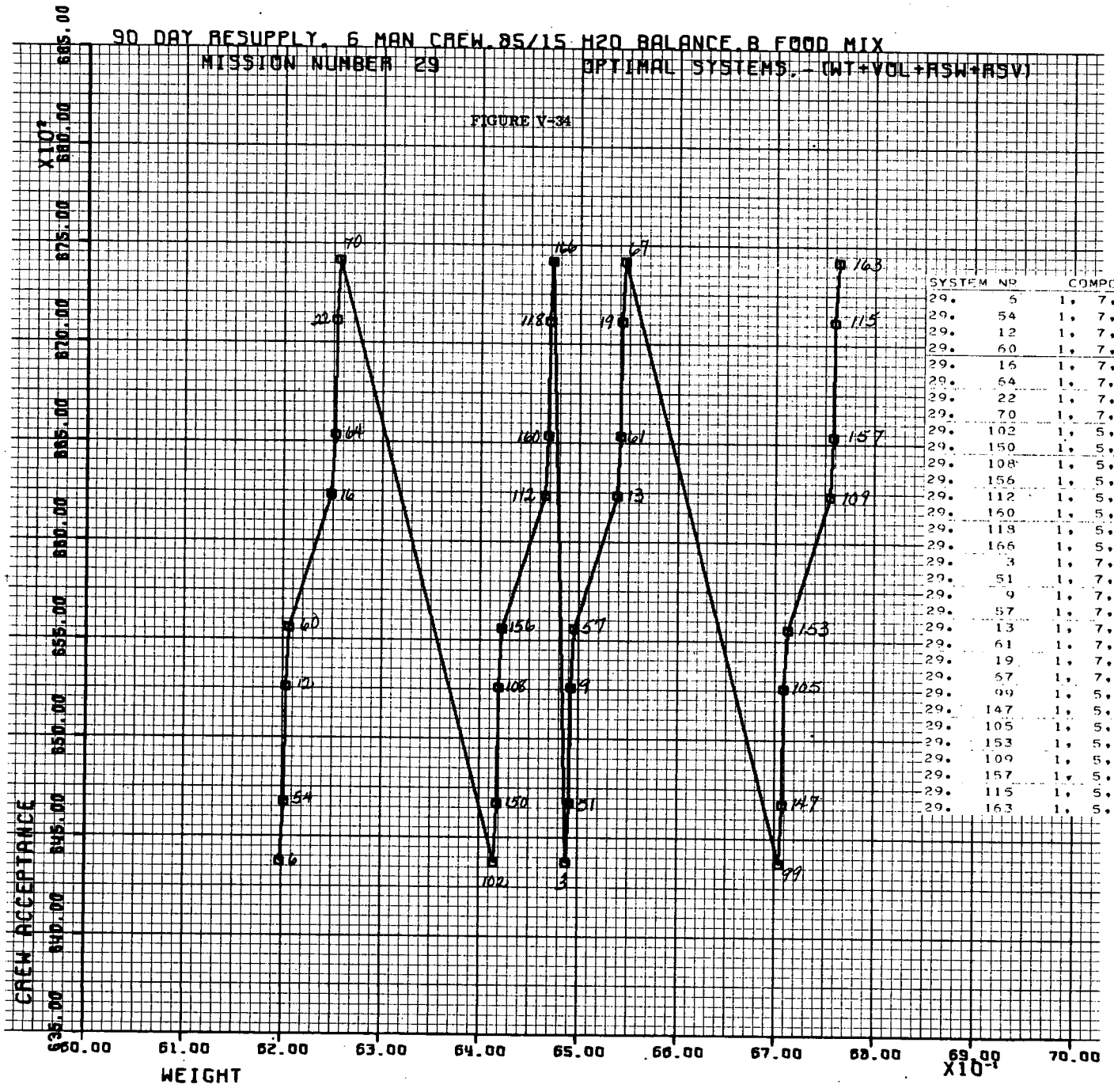


FIGURE V-33

SYSTEM	NR		COMPOSITION
29.	108	1.	5, 78,187,238,274,298
29.	102	1.	5, 78,187,244,274,298
29.	156	1.	5, 79,187,238,274,298
29.	150	1.	5, 79,187,244,274,298
29.	118	1.	5, 78,189,238,278,298
29.	112	1.	5, 78,189,244,278,298
29.	166	1.	5, 79,189,238,278,298
29.	160	1.	5, 79,189,244,278,298
29.	105	1.	5, 78,187,238,280,298
29.	99	1.	5, 78,187,244,280,298
29.	153	1.	5, 79,187,238,280,298
29.	147	1.	5, 79,187,244,280,298
29.	12	1.	7, 78,187,238,274,298
29.	6	1.	7, 78,187,244,274,298
29.	60	1.	7, 79,187,238,274,298
29.	54	1.	7, 79,187,244,274,298
29.	115	1.	5, 78,189,238,284,298
29.	109	1.	5, 78,189,244,284,298
29.	163	1.	5, 79,189,238,284,298
29.	157	1.	5, 79,189,244,284,298
29.	22	1.	7, 78,189,238,278,298
29.	16	1.	7, 78,189,244,278,298
29.	70	1.	7, 79,189,238,278,298
29.	64	1.	7, 79,189,244,278,298
29.	9	1.	7, 78,187,238,280,298
29.	3	1.	7, 78,187,244,280,298
29.	57	1.	7, 79,187,238,280,298
29.	51	1.	7, 79,187,244,280,298
29.	19	1.	7, 78,189,238,284,298
29.	13	1.	7, 78,189,244,284,298
29.	67	1.	7, 79,189,238,284,298
29.	61	1.	7, 79,189,244,284,298



SYSTEM	NR	COMPOSITION
29.	5	1, 7, 78,187,244,274,298
29.	54	1, 7, 79,187,244,274,298
29.	12	1, 7, 78,187,238,274,298
29.	60	1, 7, 79,187,238,274,298
29.	16	1, 7, 78,189,244,278,298
29.	64	1, 7, 79,189,244,278,298
29.	22	1, 7, 78,189,238,278,298
29.	70	1, 7, 79,189,238,278,298
29.	102	1, 5, 78,187,244,274,298
29.	150	1, 5, 79,187,244,274,298
29.	108	1, 5, 78,187,238,274,298
29.	156	1, 5, 79,187,238,274,298
29.	112	1, 5, 78,189,244,278,298
29.	160	1, 5, 79,189,244,278,298
29.	118	1, 5, 78,189,238,278,298
29.	166	1, 5, 79,189,238,278,298
29.	3	1, 7, 78,187,244,280,298
29.	51	1, 7, 79,187,244,280,298
29.	9	1, 7, 78,187,238,280,298
29.	57	1, 7, 79,187,238,280,298
29.	13	1, 7, 78,189,244,284,298
29.	61	1, 7, 79,189,244,284,298
29.	19	1, 7, 78,189,238,284,298
29.	67	1, 7, 79,189,238,284,298
29.	99	1, 5, 78,187,244,280,298
29.	147	1, 5, 79,187,244,280,298
29.	105	1, 5, 78,187,238,280,298
29.	153	1, 5, 79,187,238,280,298
29.	109	1, 5, 78,189,244,284,298
29.	157	1, 5, 79,189,244,284,298
29.	115	1, 5, 78,189,238,284,298
29.	163	1, 5, 79,189,238,284,298

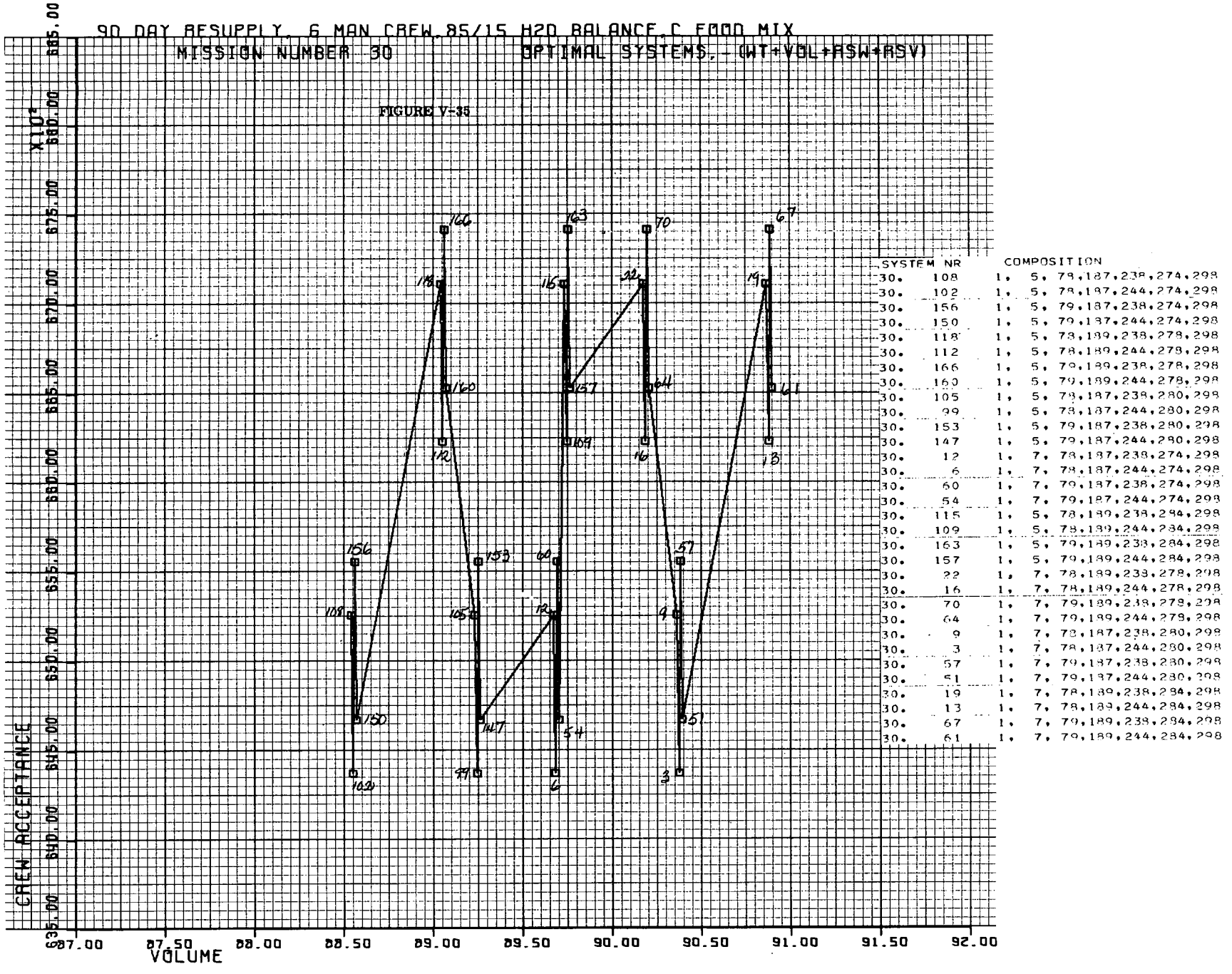
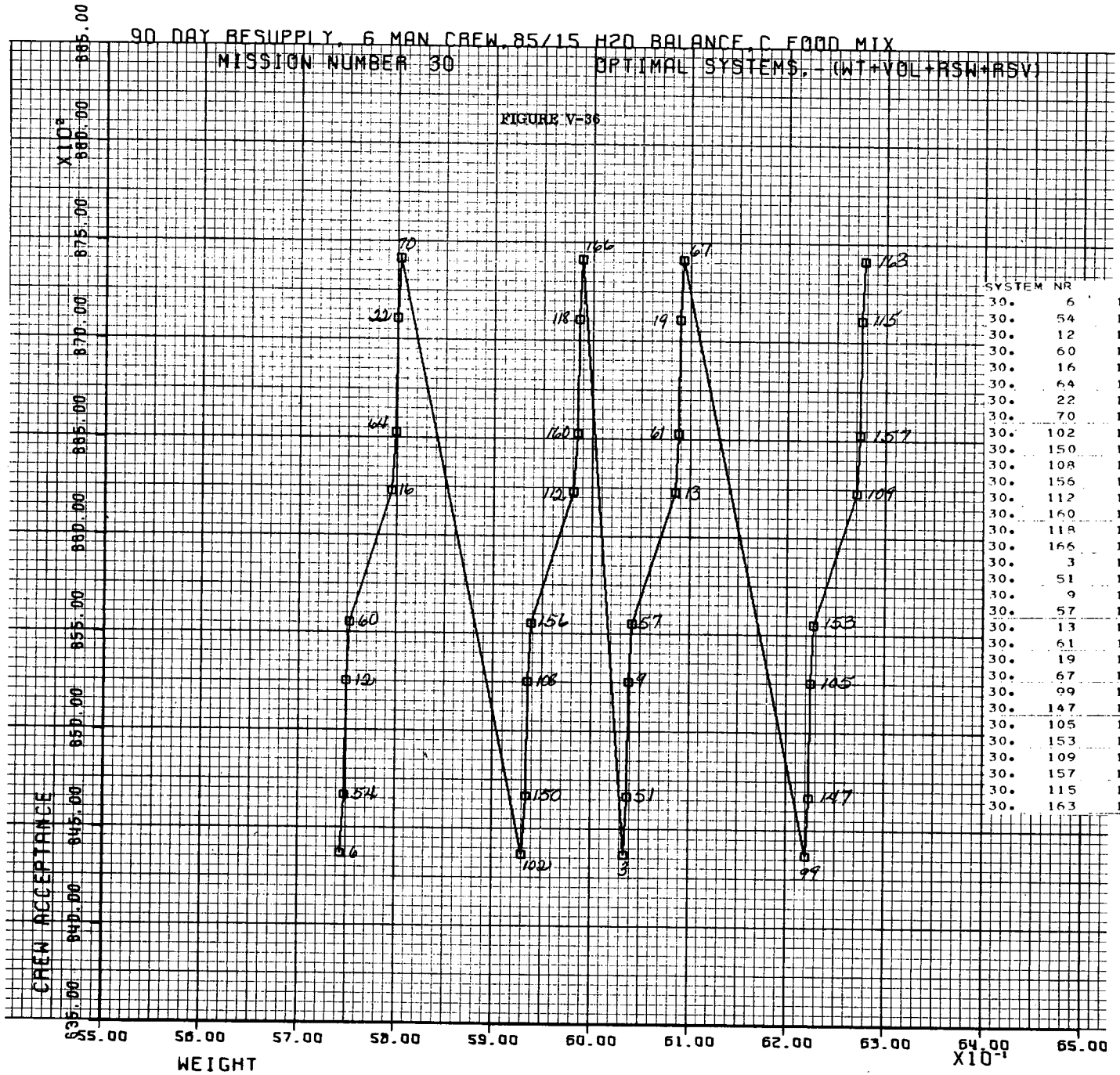


FIGURE V-35

SYSTEM NR		COMPOSITION
30.	108	1, 5, 79,187,238,274,298
30.	102	1, 5, 78,187,244,274,298
30.	156	1, 5, 79,187,238,274,298
30.	150	1, 5, 79,187,244,274,298
30.	118	1, 5, 78,189,238,278,298
30.	112	1, 5, 78,189,244,278,298
30.	166	1, 5, 79,189,238,278,298
30.	160	1, 5, 79,189,244,278,298
30.	105	1, 5, 79,187,238,280,298
30.	99	1, 5, 78,187,244,280,298
30.	153	1, 5, 79,187,238,280,298
30.	147	1, 5, 79,187,244,280,298
30.	12	1, 7, 78,187,238,274,298
30.	6	1, 7, 78,187,244,274,298
30.	60	1, 7, 79,187,238,274,298
30.	54	1, 7, 79,187,244,274,298
30.	115	1, 5, 78,189,238,284,298
30.	109	1, 5, 78,189,244,284,298
30.	163	1, 5, 79,189,238,284,298
30.	157	1, 5, 79,189,244,284,298
30.	22	1, 7, 78,189,238,278,298
30.	16	1, 7, 78,189,244,278,298
30.	70	1, 7, 79,189,238,278,298
30.	64	1, 7, 79,189,244,278,298
30.	9	1, 7, 78,187,238,280,298
30.	3	1, 7, 78,187,244,280,298
30.	57	1, 7, 79,187,238,280,298
30.	51	1, 7, 79,187,244,280,298
30.	19	1, 7, 78,189,238,284,298
30.	13	1, 7, 78,189,244,284,298
30.	67	1, 7, 79,189,238,284,298
30.	61	1, 7, 79,189,244,284,298



SYSTEM NR		COMPOSITION
30.	6	1. 7. 78,187,244,274,298
30.	54	1. 7. 79,187,244,274,298
30.	12	1. 7. 78,187,238,274,298
30.	60	1. 7. 79,187,238,274,298
30.	16	1. 7. 78,189,244,278,298
30.	64	1. 7. 79,189,244,278,298
30.	22	1. 7. 78,189,238,278,298
30.	70	1. 7. 79,189,238,278,298
30.	102	1. 5. 78,187,244,274,298
30.	150	1. 5. 79,187,244,274,298
30.	108	1. 5. 73,187,238,274,298
30.	156	1. 5. 79,187,238,274,298
30.	112	1. 5. 78,189,244,278,298
30.	160	1. 5. 79,189,244,278,298
30.	118	1. 5. 78,189,238,278,298
30.	166	1. 5. 79,189,238,278,298
30.	3	1. 7. 78,187,244,280,298
30.	51	1. 7. 79,187,244,280,298
30.	9	1. 7. 78,187,238,280,298
30.	57	1. 7. 79,187,238,280,298
30.	13	1. 7. 78,189,244,284,298
30.	61	1. 7. 79,189,244,284,298
30.	19	1. 7. 78,189,238,284,298
30.	67	1. 7. 79,189,238,284,298
30.	99	1. 5. 78,187,244,280,298
30.	147	1. 5. 79,187,244,280,298
30.	105	1. 5. 78,187,238,280,298
30.	153	1. 5. 79,187,238,280,298
30.	109	1. 5. 78,189,244,284,298
30.	157	1. 5. 79,189,244,284,298
30.	115	1. 5. 78,189,238,284,298
30.	163	1. 5. 79,189,238,284,298

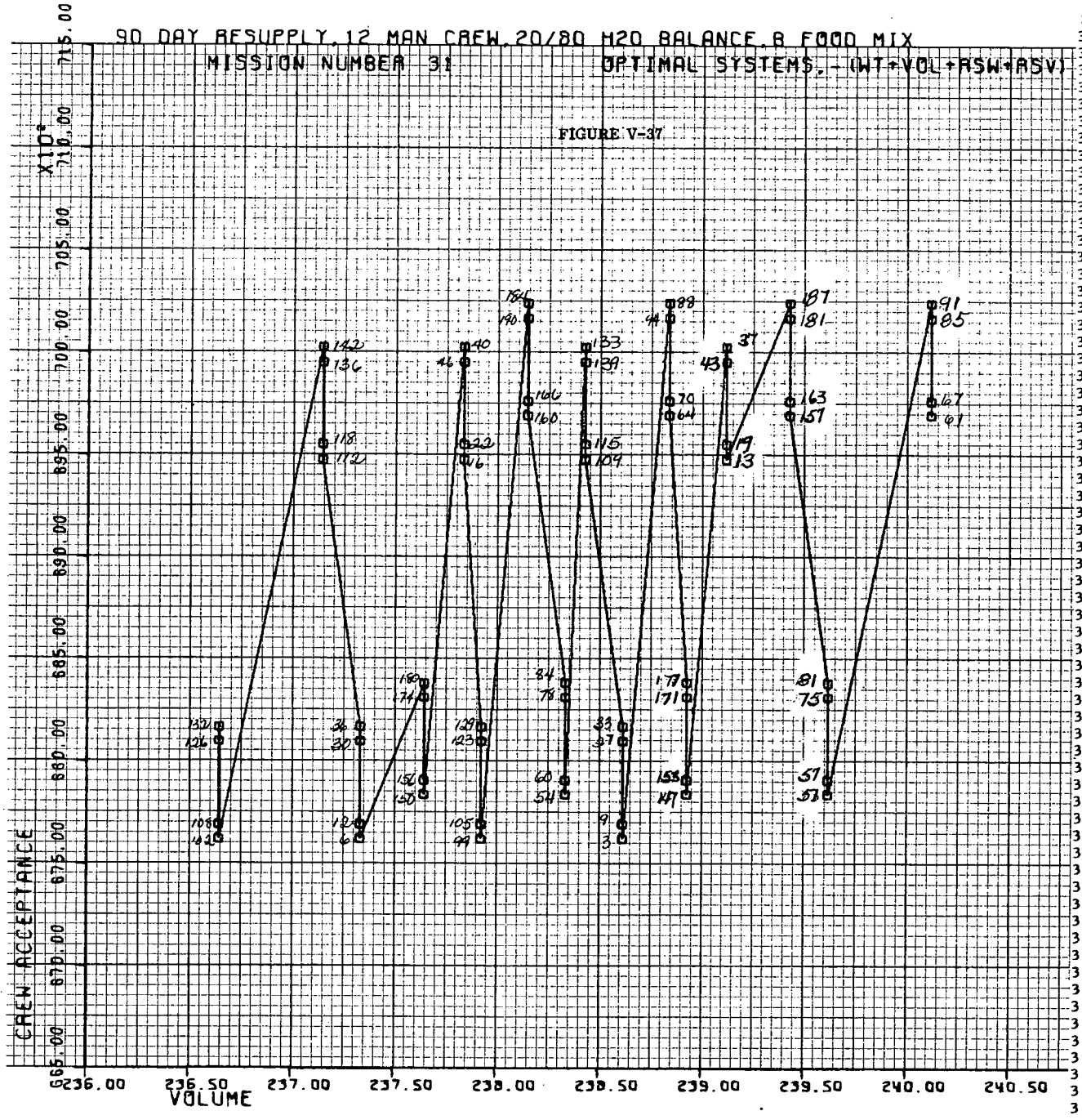


FIGURE V-37

	SYSTEM NR	COMPOSITION
31.	132	1, 5, 78,187,248,274,298
31.	126	1, 5, 78,187,244,274,298
31.	108	1, 5, 79,187,248,274,298
31.	102	1, 5, 79,187,244,274,298
31.	142	1, 5, 78,189,248,278,298
31.	136	1, 5, 78,189,244,278,298
31.	118	1, 5, 79,189,248,278,298
31.	112	1, 5, 79,189,244,278,298
31.	36	1, 7, 78,187,248,274,298
31.	30	1, 7, 78,187,244,274,298
31.	12	1, 7, 79,187,248,274,298
31.	6	1, 7, 79,187,244,274,298
31.	180	1, 5, 76,187,248,274,298
31.	174	1, 5, 76,187,244,274,298
31.	156	1, 5, 77,187,248,274,298
31.	150	1, 5, 77,187,244,274,298
31.	46	1, 7, 78,189,248,278,298
31.	40	1, 7, 78,189,244,278,298
31.	22	1, 7, 79,189,248,278,298
31.	16	1, 7, 79,189,244,278,298
31.	129	1, 5, 78,187,248,280,298
31.	123	1, 5, 78,187,244,280,298
31.	105	1, 5, 79,187,248,280,298
31.	99	1, 5, 79,187,244,280,298
31.	190	1, 5, 76,189,248,278,298
31.	184	1, 5, 76,189,244,278,298
31.	166	1, 5, 77,189,248,278,298
31.	160	1, 5, 77,189,244,278,298
31.	84	1, 7, 76,187,248,274,298
31.	78	1, 7, 76,187,244,274,298
31.	60	1, 7, 77,187,248,274,298
31.	54	1, 7, 77,187,244,274,298
31.	139	1, 5, 78,189,248,284,298
31.	133	1, 5, 78,189,244,284,298
31.	115	1, 5, 79,189,248,284,298
31.	109	1, 5, 79,189,244,284,298
31.	33	1, 7, 78,187,248,280,298
31.	27	1, 7, 78,187,244,280,298
31.	9	1, 7, 79,187,248,280,298
31.	3	1, 7, 79,187,244,280,298
31.	94	1, 7, 76,189,248,278,298
31.	88	1, 7, 76,189,244,278,298
31.	70	1, 7, 77,189,248,278,298
31.	64	1, 7, 77,189,244,278,298
31.	177	1, 5, 76,187,248,280,298
31.	171	1, 5, 76,187,244,280,298
31.	153	1, 5, 77,187,248,280,298
31.	147	1, 5, 77,187,244,280,298
31.	43	1, 7, 78,189,248,284,298
31.	37	1, 7, 78,189,244,284,298
31.	19	1, 7, 79,189,248,284,298
31.	13	1, 7, 79,189,244,284,298
31.	187	1, 5, 76,189,248,284,298
31.	181	1, 5, 76,189,244,284,298
31.	163	1, 5, 77,189,248,284,298
31.	157	1, 5, 77,189,244,284,298
31.	81	1, 7, 76,187,248,280,298
31.	75	1, 7, 76,187,244,280,298
31.	57	1, 7, 77,187,248,280,298
31.	51	1, 7, 77,187,244,280,298
31.	91	1, 7, 76,189,248,284,298
31.	85	1, 7, 76,189,244,284,298
31.	67	1, 7, 77,189,248,284,298
31.	61	1, 7, 77,189,244,284,298

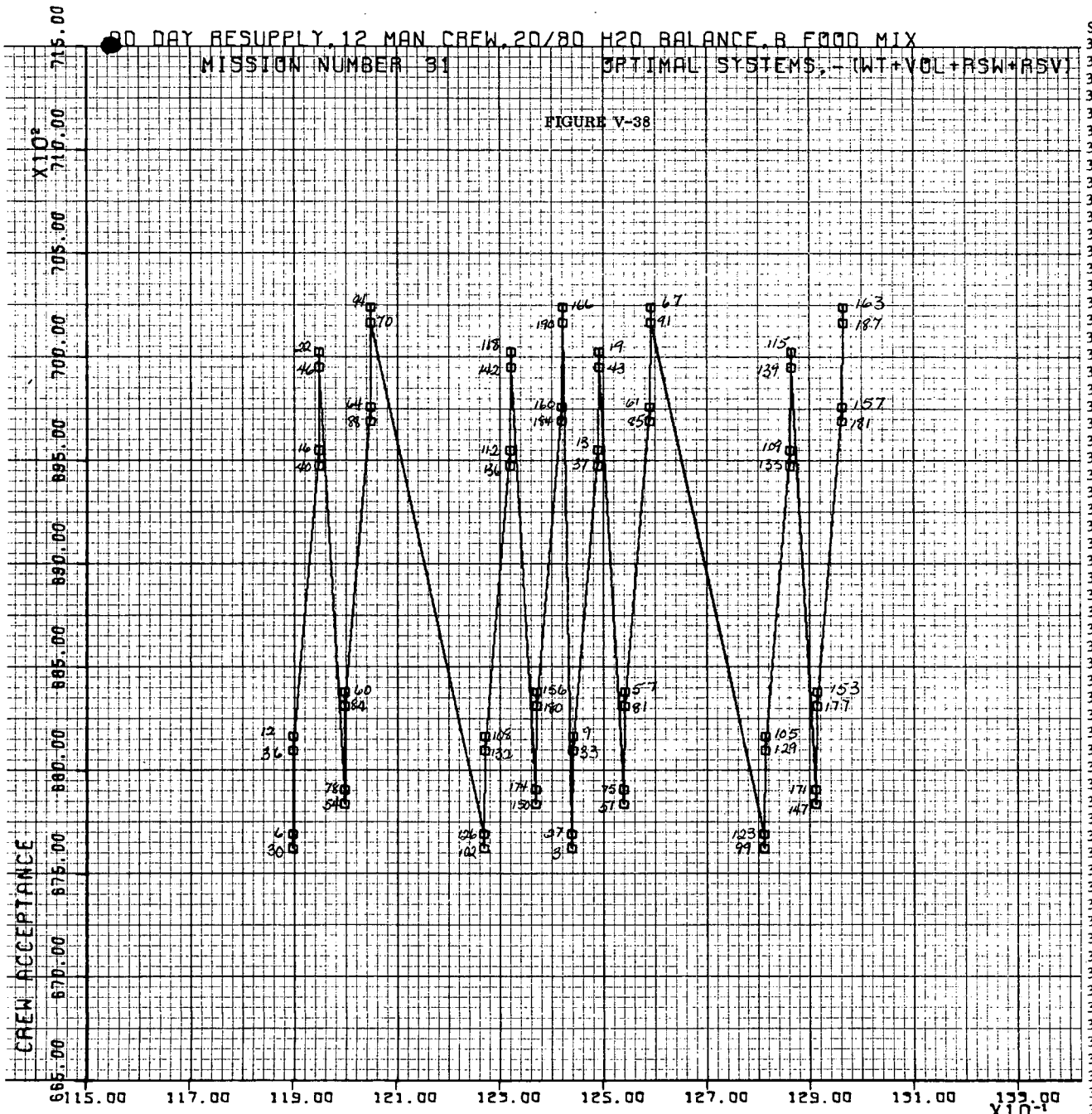


FIGURE V-38

SYSTEM NR		COMPOSITION
31.	30	1, 7, 78,187,244,274,298
31.	6	1, 7, 79,187,244,274,298
31.	36	1, 7, 78,187,248,274,298
31.	12	1, 7, 79,187,248,274,298
31.	40	1, 7, 78,189,244,278,298
31.	16	1, 7, 79,189,244,278,298
31.	46	1, 7, 78,189,248,278,298
31.	22	1, 7, 79,189,248,278,298
31.	78	1, 7, 76,187,244,274,298
31.	54	1, 7, 77,187,244,274,298
31.	84	1, 7, 76,187,248,274,298
31.	60	1, 7, 77,187,248,274,298
31.	88	1, 7, 76,189,244,278,298
31.	64	1, 7, 77,189,244,278,298
31.	94	1, 7, 76,189,248,278,298
31.	70	1, 7, 77,189,248,278,298
31.	126	1, 5, 78,187,244,274,298
31.	102	1, 5, 79,187,244,274,298
31.	132	1, 5, 78,187,248,274,298
31.	108	1, 5, 79,187,248,274,298
31.	136	1, 5, 78,189,244,278,298
31.	112	1, 5, 79,189,244,278,298
31.	142	1, 5, 78,189,248,278,298
31.	118	1, 5, 79,189,248,278,298
31.	174	1, 5, 76,187,244,274,298
31.	150	1, 5, 77,187,244,274,298
31.	180	1, 5, 76,187,248,274,298
31.	156	1, 5, 77,187,248,274,298
31.	184	1, 5, 76,189,244,278,298
31.	160	1, 5, 77,189,244,278,298
31.	190	1, 5, 76,189,248,278,298
31.	166	1, 5, 77,189,248,278,298
31.	27	1, 7, 78,187,244,280,298
31.	3	1, 7, 79,187,244,280,298
31.	33	1, 7, 78,187,248,280,298
31.	9	1, 7, 79,187,248,280,298
31.	37	1, 7, 78,189,244,284,298
31.	13	1, 7, 79,189,244,284,298
31.	43	1, 7, 78,189,248,284,298
31.	19	1, 7, 79,189,248,284,298
31.	75	1, 7, 76,187,244,280,298
31.	51	1, 7, 77,187,244,280,298
31.	81	1, 7, 76,187,248,280,298
31.	57	1, 7, 77,187,248,280,298
31.	85	1, 7, 76,189,244,284,298
31.	61	1, 7, 77,189,244,284,298
31.	91	1, 7, 76,189,248,284,298
31.	67	1, 7, 77,189,248,284,298
31.	123	1, 5, 78,187,244,280,298
31.	99	1, 5, 79,187,244,280,298
31.	129	1, 5, 78,187,248,280,298
31.	105	1, 5, 79,187,248,280,298
31.	133	1, 5, 78,189,244,284,298
31.	109	1, 5, 79,189,244,284,298
31.	139	1, 5, 78,189,248,284,298
31.	115	1, 5, 79,189,248,284,298
31.	171	1, 5, 76,187,244,280,298
31.	147	1, 5, 77,187,244,280,298
31.	177	1, 5, 76,187,248,280,298
31.	153	1, 5, 77,187,248,280,298
31.	181	1, 5, 76,189,244,284,298
31.	157	1, 5, 77,189,244,284,298
31.	187	1, 5, 76,189,248,284,298
31.	163	1, 5, 77,189,248,284,298

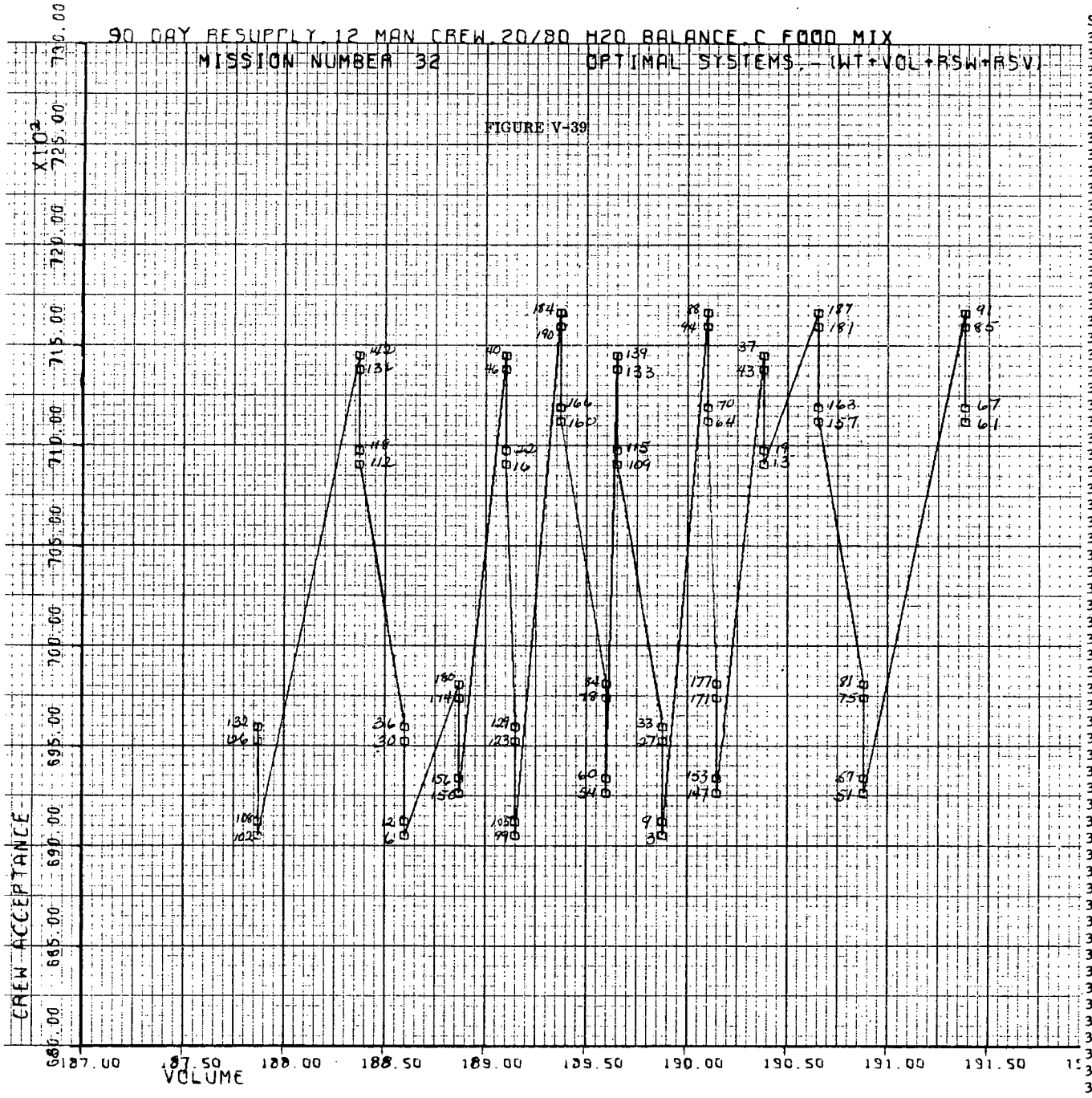


FIGURE V-39

SYSTEM NR		COMPOSITION
32.	132	1, 5, 78,187,248,274,298
32.	126	1, 5, 78,187,244,274,298
32.	108	1, 5, 79,187,248,274,298
32.	102	1, 5, 79,187,244,274,298
32.	142	1, 5, 78,189,248,278,298
32.	136	1, 5, 78,189,244,278,298
32.	118	1, 5, 79,189,248,278,298
32.	112	1, 5, 79,189,244,278,298
32.	36	1, 7, 78,187,248,274,298
32.	30	1, 7, 78,187,244,274,298
32.	12	1, 7, 79,187,248,274,298
32.	6	1, 7, 79,187,244,274,298
32.	180	1, 5, 76,187,248,274,298
32.	174	1, 5, 76,187,244,274,298
32.	156	1, 5, 77,187,248,274,298
32.	150	1, 5, 77,187,244,274,298
32.	46	1, 7, 78,189,248,278,298
32.	40	1, 7, 78,189,244,278,298
32.	22	1, 7, 79,189,248,278,298
32.	16	1, 7, 79,189,244,278,298
32.	129	1, 5, 78,187,248,280,298
32.	123	1, 5, 78,187,244,280,298
32.	105	1, 5, 79,187,248,280,298
32.	99	1, 5, 79,187,244,280,298
32.	190	1, 5, 76,189,248,278,298
32.	184	1, 5, 76,189,244,278,298
32.	166	1, 5, 77,189,248,278,298
32.	160	1, 5, 77,189,244,278,298
32.	84	1, 7, 76,187,248,274,298
32.	78	1, 7, 76,187,244,274,298
32.	60	1, 7, 77,187,248,274,298
32.	54	1, 7, 77,187,244,274,298
32.	139	1, 5, 78,189,248,284,298
32.	133	1, 5, 78,189,244,284,298
32.	115	1, 5, 79,189,248,284,298
32.	109	1, 5, 79,189,244,284,298
32.	33	1, 7, 78,187,248,280,298
32.	27	1, 7, 78,187,244,280,298
32.	9	1, 7, 79,187,248,280,298
32.	3	1, 7, 79,187,244,280,298
32.	94	1, 7, 76,189,248,278,298
32.	88	1, 7, 76,189,244,278,298
32.	70	1, 7, 77,189,248,278,298
32.	64	1, 7, 77,189,244,278,298
32.	177	1, 5, 76,187,248,280,298
32.	171	1, 5, 76,187,244,280,298
32.	153	1, 5, 77,187,248,280,298
32.	147	1, 5, 77,187,244,280,298
32.	43	1, 7, 78,189,248,284,298
32.	37	1, 7, 78,189,244,284,298
32.	19	1, 7, 79,189,248,284,298
32.	13	1, 7, 79,189,244,284,298
32.	187	1, 5, 76,189,248,284,298
32.	181	1, 5, 76,189,244,284,298
32.	163	1, 5, 77,189,248,284,298
32.	157	1, 5, 77,189,244,284,298
32.	81	1, 7, 76,187,248,280,298
32.	75	1, 7, 76,187,244,280,298
32.	57	1, 7, 77,187,248,280,298
32.	51	1, 7, 77,187,244,280,298
32.	91	1, 7, 76,189,248,284,298
32.	85	1, 7, 76,189,244,284,298
32.	67	1, 7, 77,189,248,284,298
32.	61	1, 7, 77,189,244,284,298

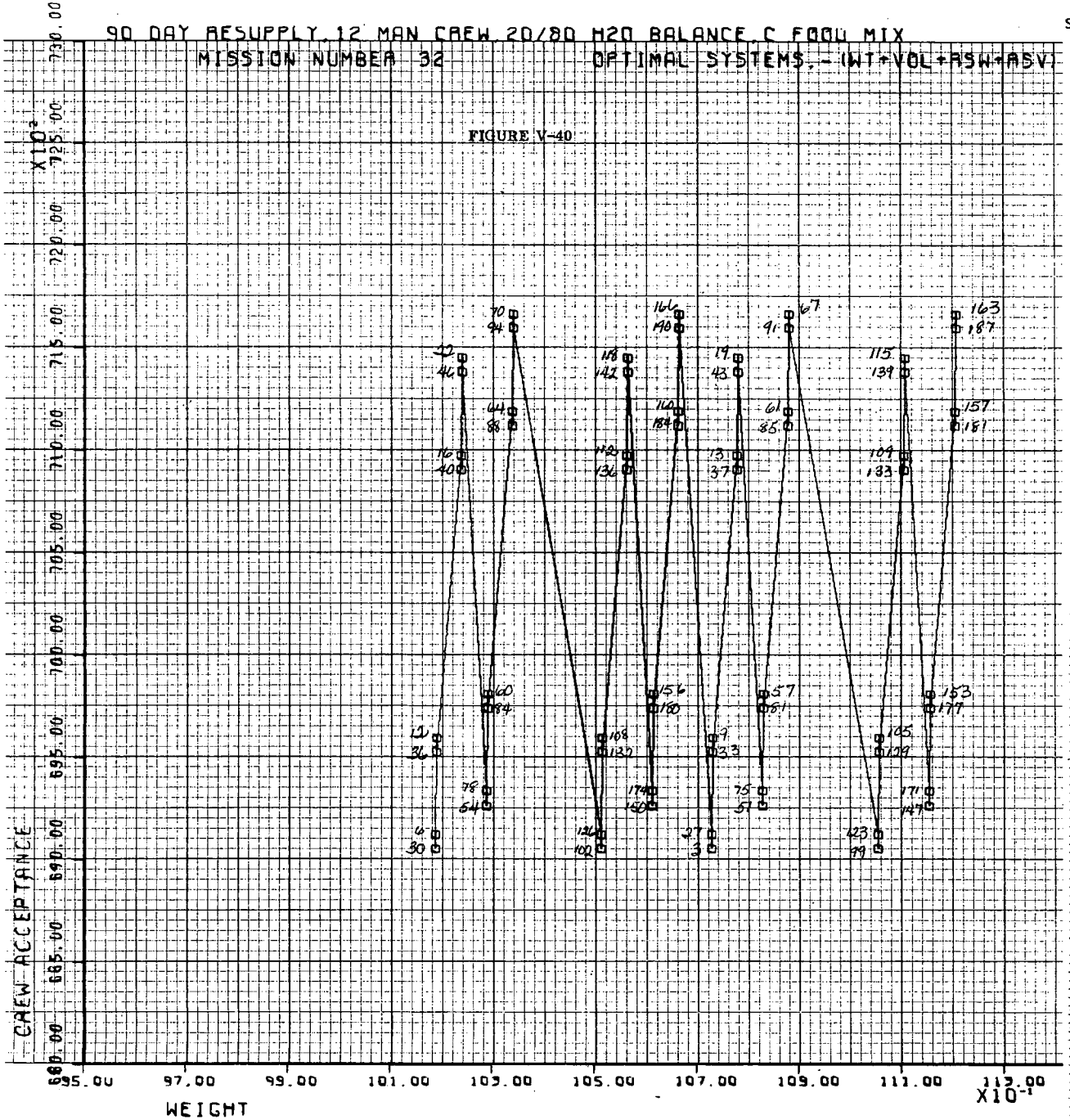


FIGURE V-40

SYSTEM NR		COMPOSITION
32.	30	1, 7, 78,187,244,274,298
32.	6	1, 7, 79,187,244,274,298
32.	36	1, 7, 78,187,248,274,298
32.	12	1, 7, 79,187,248,274,298
32.	40	1, 7, 78,189,244,278,298
32.	16	1, 7, 79,189,244,278,298
32.	46	1, 7, 78,189,248,278,298
32.	22	1, 7, 79,189,248,278,298
32.	78	1, 7, 76,187,244,274,298
32.	54	1, 7, 77,187,244,274,298
32.	84	1, 7, 76,187,248,274,298
32.	60	1, 7, 77,187,248,274,298
32.	88	1, 7, 76,189,244,278,298
32.	64	1, 7, 77,189,244,278,298
32.	94	1, 7, 76,189,248,278,298
32.	70	1, 7, 77,189,248,278,298
32.	126	1, 5, 78,187,244,274,298
32.	102	1, 5, 79,187,244,274,298
32.	132	1, 5, 78,187,248,274,298
32.	108	1, 5, 79,187,248,274,298
32.	136	1, 5, 78,189,244,278,298
32.	112	1, 5, 79,189,244,278,298
32.	142	1, 5, 78,189,248,278,298
32.	118	1, 5, 79,189,248,278,298
32.	174	1, 5, 76,187,244,274,298
32.	150	1, 5, 77,187,244,274,298
32.	180	1, 5, 76,187,248,274,298
32.	156	1, 5, 77,187,248,274,298
32.	184	1, 5, 76,189,244,278,298
32.	160	1, 5, 77,189,244,278,298
32.	190	1, 5, 76,189,248,278,298
32.	166	1, 5, 77,189,248,278,298
32.	27	1, 7, 78,187,244,280,298
32.	3	1, 7, 79,187,244,280,298
32.	33	1, 7, 78,187,248,280,298
32.	9	1, 7, 79,187,248,280,298
32.	37	1, 7, 78,189,244,284,298
32.	13	1, 7, 79,189,244,284,298
32.	43	1, 7, 78,189,248,284,298
32.	19	1, 7, 79,189,248,284,298
32.	75	1, 7, 76,187,244,280,298
32.	51	1, 7, 77,187,244,280,298
32.	81	1, 7, 76,187,248,280,298
32.	57	1, 7, 77,187,248,280,298
32.	85	1, 7, 76,189,244,284,298
32.	61	1, 7, 77,189,244,284,298
32.	91	1, 7, 76,189,248,284,298
32.	67	1, 7, 77,189,248,284,298
32.	123	1, 5, 78,187,244,280,298
32.	99	1, 5, 79,187,244,280,298
32.	129	1, 5, 78,187,248,280,298
32.	105	1, 5, 79,187,248,280,298
32.	133	1, 5, 78,189,244,284,298
32.	109	1, 5, 79,189,244,284,298
32.	139	1, 5, 78,189,248,284,298
32.	115	1, 5, 79,189,248,284,298
32.	171	1, 5, 76,187,244,280,298
32.	147	1, 5, 77,187,244,280,298
32.	177	1, 5, 76,187,248,280,298
32.	153	1, 5, 77,187,248,280,298
32.	181	1, 5, 76,189,244,284,298
32.	157	1, 5, 77,189,244,284,298
32.	187	1, 5, 76,189,248,284,298
32.	163	1, 5, 77,189,248,284,298

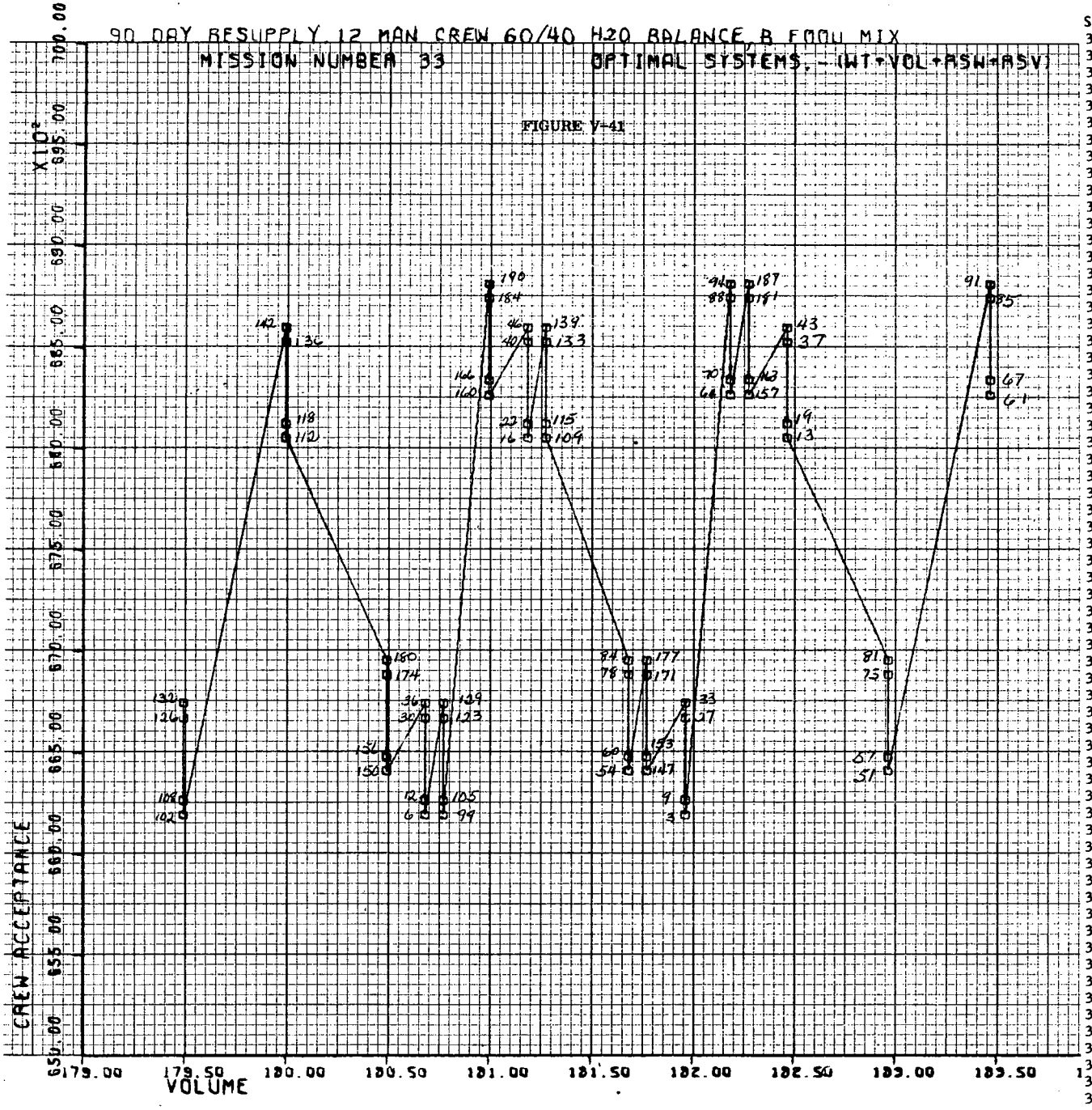


FIGURE V-41

SYSTEM NR		COMPOSITION
33.	132	1, 5, 78,187,248,274,298
33.	126	1, 5, 78,187,244,274,298
33.	108	1, 5, 79,187,248,274,298
33.	102	1, 5, 79,187,244,274,298
33.	142	1, 5, 78,189,248,278,298
33.	136	1, 5, 78,189,244,278,298
33.	118	1, 5, 79,189,248,278,298
33.	112	1, 5, 79,189,244,278,298
33.	180	1, 5, 76,187,248,274,298
33.	174	1, 5, 76,187,244,274,298
33.	156	1, 5, 77,187,248,274,298
33.	150	1, 5, 77,187,244,274,298
33.	36	1, 7, 78,187,248,274,298
33.	30	1, 7, 78,187,244,274,298
33.	12	1, 7, 79,187,248,274,298
33.	6	1, 7, 79,187,244,274,298
33.	129	1, 5, 78,187,248,280,298
33.	123	1, 5, 78,187,244,280,298
33.	105	1, 5, 79,187,248,280,298
33.	99	1, 5, 79,187,244,280,298
33.	190	1, 5, 76,189,248,278,298
33.	184	1, 5, 76,189,244,278,298
33.	166	1, 5, 77,189,248,278,298
33.	160	1, 5, 77,189,244,278,298
33.	46	1, 7, 78,189,248,278,298
33.	40	1, 7, 78,189,244,278,298
33.	22	1, 7, 79,189,248,278,298
33.	16	1, 7, 79,189,244,278,298
33.	139	1, 5, 78,189,248,284,298
33.	133	1, 5, 78,189,244,284,298
33.	115	1, 5, 79,189,248,284,298
33.	109	1, 5, 79,189,244,284,298
33.	84	1, 7, 76,187,248,274,298
33.	78	1, 7, 76,187,244,274,298
33.	60	1, 7, 77,187,248,274,298
33.	54	1, 7, 77,187,244,274,298
33.	177	1, 5, 76,187,248,280,298
33.	171	1, 5, 76,187,244,280,298
33.	153	1, 5, 77,187,248,280,298
33.	147	1, 5, 77,187,244,280,298
33.	33	1, 7, 78,187,248,280,298
33.	27	1, 7, 78,187,244,280,298
33.	9	1, 7, 79,187,248,280,298
33.	3	1, 7, 79,187,244,280,298
33.	94	1, 7, 76,189,248,278,298
33.	88	1, 7, 76,189,244,278,298
33.	70	1, 7, 77,189,248,278,298
33.	64	1, 7, 77,189,244,278,298
33.	187	1, 5, 76,189,248,284,298
33.	181	1, 5, 76,189,244,284,298
33.	163	1, 5, 77,189,248,284,298
33.	157	1, 5, 77,189,244,284,298
33.	43	1, 7, 78,189,248,284,298
33.	37	1, 7, 78,189,244,284,298
33.	19	1, 7, 79,189,248,284,298
33.	13	1, 7, 79,189,244,284,298
33.	81	1, 7, 76,187,248,280,298
33.	75	1, 7, 76,187,244,280,298
33.	57	1, 7, 77,187,248,280,298
33.	51	1, 7, 77,187,244,280,298
33.	91	1, 7, 76,189,248,284,298
33.	85	1, 7, 76,189,244,284,298
33.	67	1, 7, 77,189,248,284,298
33.	61	1, 7, 77,189,244,284,298

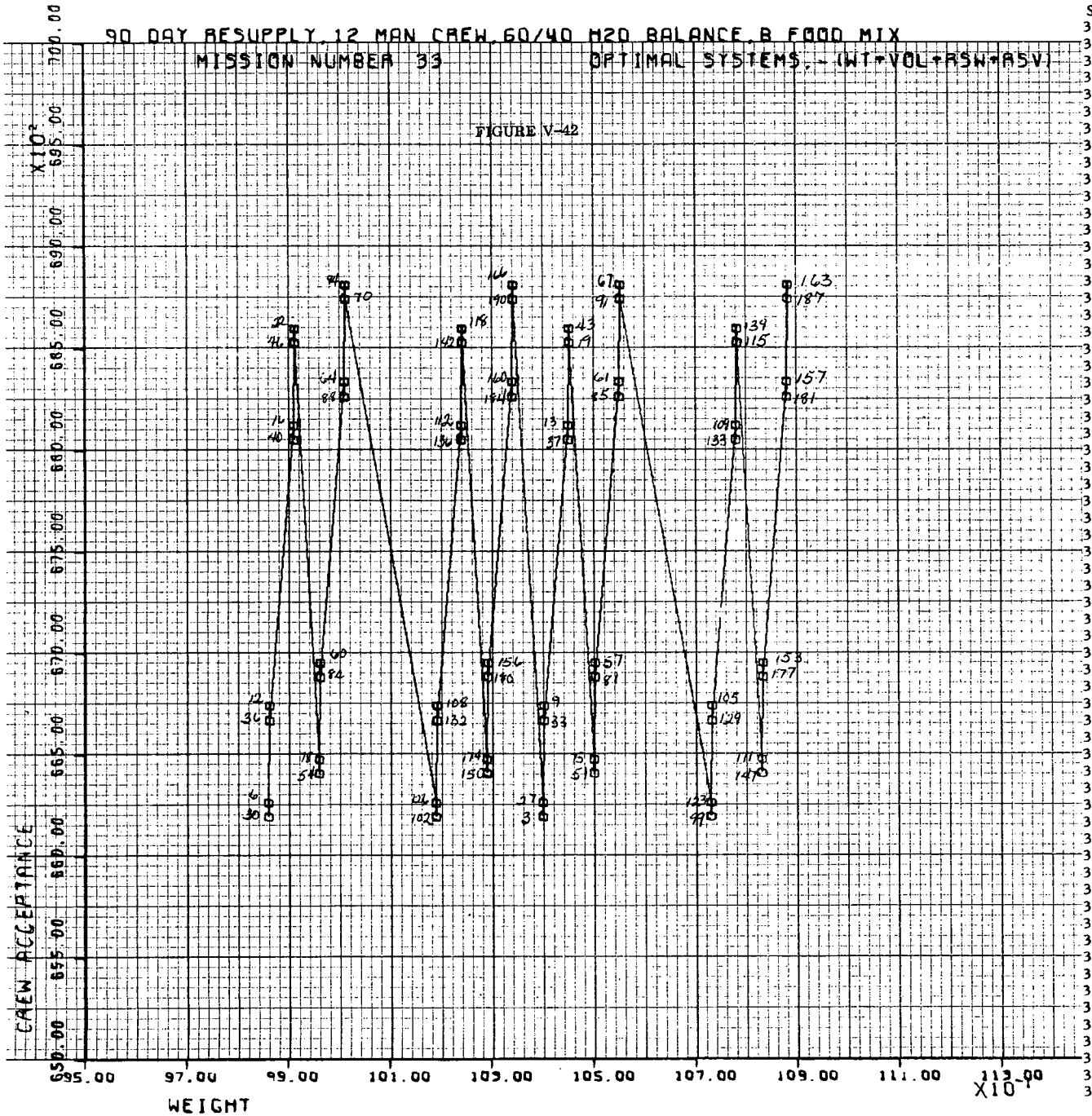


FIGURE V-42

SYSTEM NR		COMPOSITION
33.	30	1, 7, 78,187,244,274,298
33.	6	1, 7, 79,187,244,274,298
33.	36	1, 7, 78,187,248,274,298
33.	12	1, 7, 79,187,248,274,298
33.	40	1, 7, 78,189,244,278,298
33.	16	1, 7, 79,189,244,278,298
33.	46	1, 7, 78,189,248,278,298
33.	22	1, 7, 79,189,248,278,298
33.	78	1, 7, 76,187,244,274,298
33.	54	1, 7, 77,187,244,274,298
33.	84	1, 7, 76,187,248,274,298
33.	60	1, 7, 77,187,248,274,298
33.	88	1, 7, 76,189,244,278,298
33.	64	1, 7, 77,189,244,278,298
33.	94	1, 7, 76,189,248,278,298
33.	70	1, 7, 77,189,248,278,298
33.	126	1, 5, 78,187,244,274,298
33.	102	1, 5, 79,187,244,274,298
33.	132	1, 5, 78,187,248,274,298
33.	108	1, 5, 79,187,248,274,298
33.	136	1, 5, 78,189,244,278,298
33.	112	1, 5, 79,189,244,278,298
33.	142	1, 5, 78,189,248,278,298
33.	118	1, 5, 79,189,248,278,298
33.	174	1, 5, 76,187,244,274,298
33.	150	1, 5, 77,187,244,274,298
33.	180	1, 5, 76,187,248,274,298
33.	156	1, 5, 77,187,248,274,298
33.	184	1, 5, 76,189,244,278,298
33.	160	1, 5, 77,189,244,278,298
33.	190	1, 5, 76,189,248,278,298
33.	166	1, 5, 77,189,248,278,298
33.	27	1, 7, 78,187,244,280,298
33.	3	1, 7, 79,187,244,280,298
33.	33	1, 7, 78,187,248,280,298
33.	9	1, 7, 79,187,248,280,298
33.	37	1, 7, 78,189,244,284,298
33.	13	1, 7, 79,189,244,284,298
33.	43	1, 7, 78,189,248,284,298
33.	19	1, 7, 79,189,248,284,298
33.	75	1, 7, 76,187,244,280,298
33.	51	1, 7, 77,187,244,280,298
33.	81	1, 7, 76,187,248,280,298
33.	57	1, 7, 77,187,248,280,298
33.	85	1, 7, 76,189,244,284,298
33.	61	1, 7, 77,189,244,284,298
33.	91	1, 7, 76,189,248,284,298
33.	67	1, 7, 77,189,248,284,298
33.	123	1, 5, 78,187,244,280,298
33.	99	1, 5, 79,187,244,280,298
33.	129	1, 5, 78,187,248,280,298
33.	105	1, 5, 79,187,248,280,298
33.	133	1, 5, 78,189,244,284,298
33.	109	1, 5, 79,189,244,284,298
33.	139	1, 5, 78,189,248,284,298
33.	115	1, 5, 79,189,248,284,298
33.	171	1, 5, 76,187,244,280,298
33.	147	1, 5, 77,187,244,280,298
33.	177	1, 5, 76,187,248,280,298
33.	153	1, 5, 77,187,248,280,298
33.	181	1, 5, 76,189,244,284,298
33.	157	1, 5, 77,189,244,284,298
33.	187	1, 5, 76,189,248,284,298
33.	163	1, 5, 77,189,248,284,298

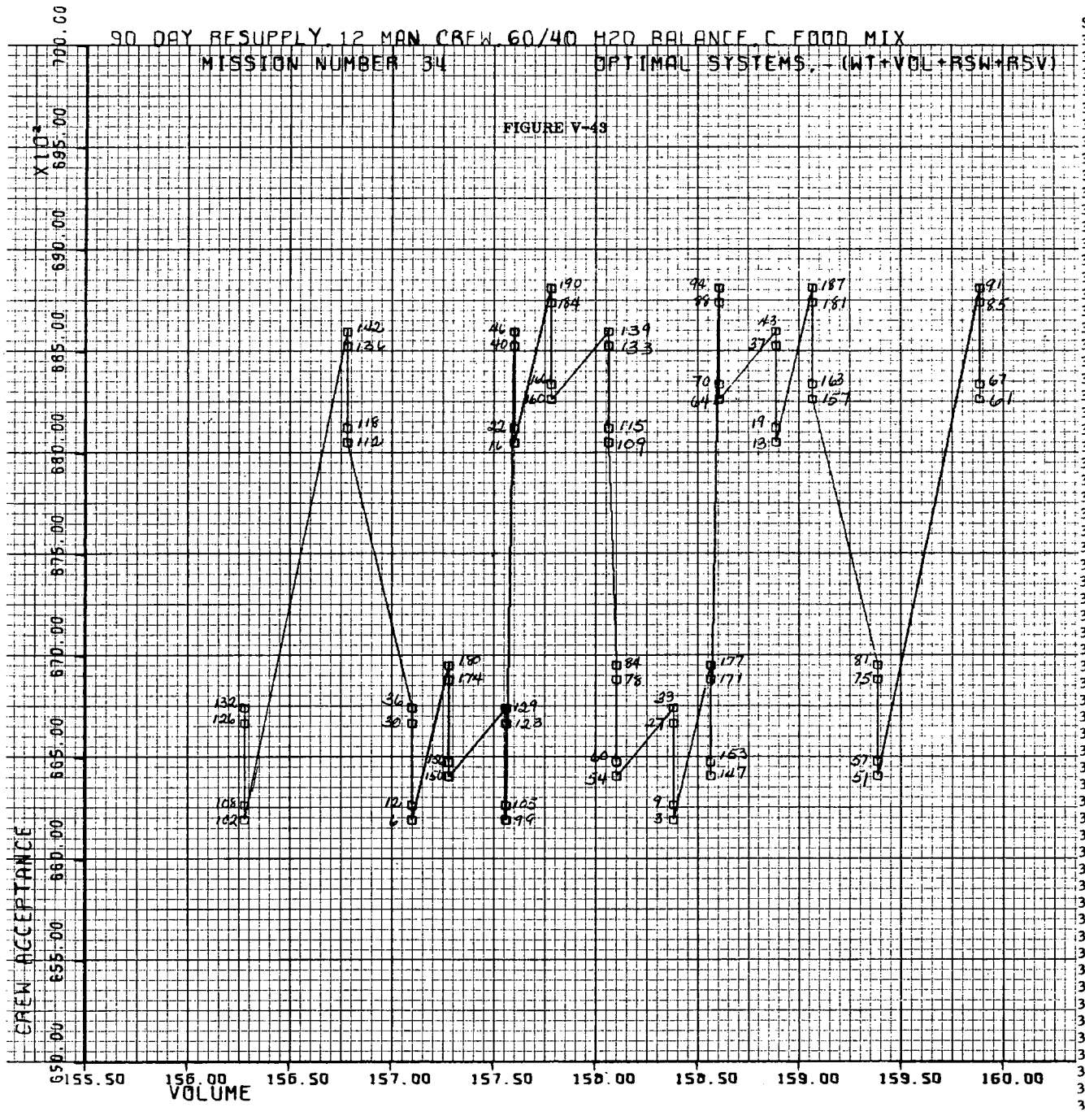


FIGURE V-43

SYSTEM NR		COMPOSITION
34.	132	1, 5, 78,187,248,274,298
34.	126	1, 5, 78,187,244,274,298
34.	108	1, 5, 79,187,248,274,298
34.	102	1, 5, 79,187,244,274,298
34.	142	1, 5, 78,189,248,278,298
34.	136	1, 5, 78,189,244,278,298
34.	118	1, 5, 79,189,248,278,298
34.	112	1, 5, 79,189,244,278,298
34.	36	1, 7, 78,187,248,274,298
34.	30	1, 7, 78,187,244,274,298
34.	12	1, 7, 79,187,248,274,298
34.	6	1, 7, 79,187,244,274,298
34.	180	1, 5, 76,187,248,274,298
34.	174	1, 5, 76,187,244,274,298
34.	156	1, 5, 77,187,248,274,298
34.	150	1, 5, 77,187,244,274,298
34.	129	1, 5, 78,187,248,280,298
34.	123	1, 5, 78,187,244,280,298
34.	105	1, 5, 79,187,248,280,298
34.	99	1, 5, 79,187,244,280,298
34.	46	1, 7, 78,189,248,278,298
34.	40	1, 7, 78,189,244,278,298
34.	22	1, 7, 79,189,248,278,298
34.	16	1, 7, 79,189,244,278,298
34.	190	1, 5, 76,189,248,278,298
34.	184	1, 5, 76,189,244,278,298
34.	166	1, 5, 77,189,248,278,298
34.	160	1, 5, 77,189,244,278,298
34.	139	1, 5, 78,189,248,284,298
34.	133	1, 5, 78,189,244,284,298
34.	115	1, 5, 79,189,248,284,298
34.	109	1, 5, 79,189,244,284,298
34.	84	1, 7, 76,187,248,274,298
34.	78	1, 7, 76,187,244,274,298
34.	60	1, 7, 77,187,248,274,298
34.	54	1, 7, 77,187,244,274,298
34.	33	1, 7, 78,187,248,280,298
34.	27	1, 7, 78,187,244,280,298
34.	9	1, 7, 79,187,248,280,298
34.	3	1, 7, 79,187,244,280,298
34.	177	1, 5, 76,187,248,280,298
34.	171	1, 5, 76,187,244,280,298
34.	153	1, 5, 77,187,248,280,298
34.	147	1, 5, 77,187,244,280,298
34.	94	1, 7, 76,189,248,278,298
34.	88	1, 7, 76,189,244,278,298
34.	70	1, 7, 77,189,248,278,298
34.	64	1, 7, 77,189,244,278,298
34.	43	1, 7, 78,189,248,284,298
34.	37	1, 7, 78,189,244,284,298
34.	19	1, 7, 79,189,248,284,298
34.	13	1, 7, 79,189,244,284,298
34.	187	1, 5, 76,189,248,284,298
34.	181	1, 5, 76,189,244,284,298
34.	163	1, 5, 77,189,248,284,298
34.	157	1, 5, 77,189,244,284,298
34.	81	1, 7, 76,187,248,280,298
34.	75	1, 7, 76,187,244,280,298
34.	57	1, 7, 77,187,248,280,298
34.	51	1, 7, 77,187,244,280,298
34.	91	1, 7, 76,189,248,284,298
34.	85	1, 7, 76,189,244,284,298
34.	67	1, 7, 77,189,248,284,298
34.	61	1, 7, 77,189,244,284,298

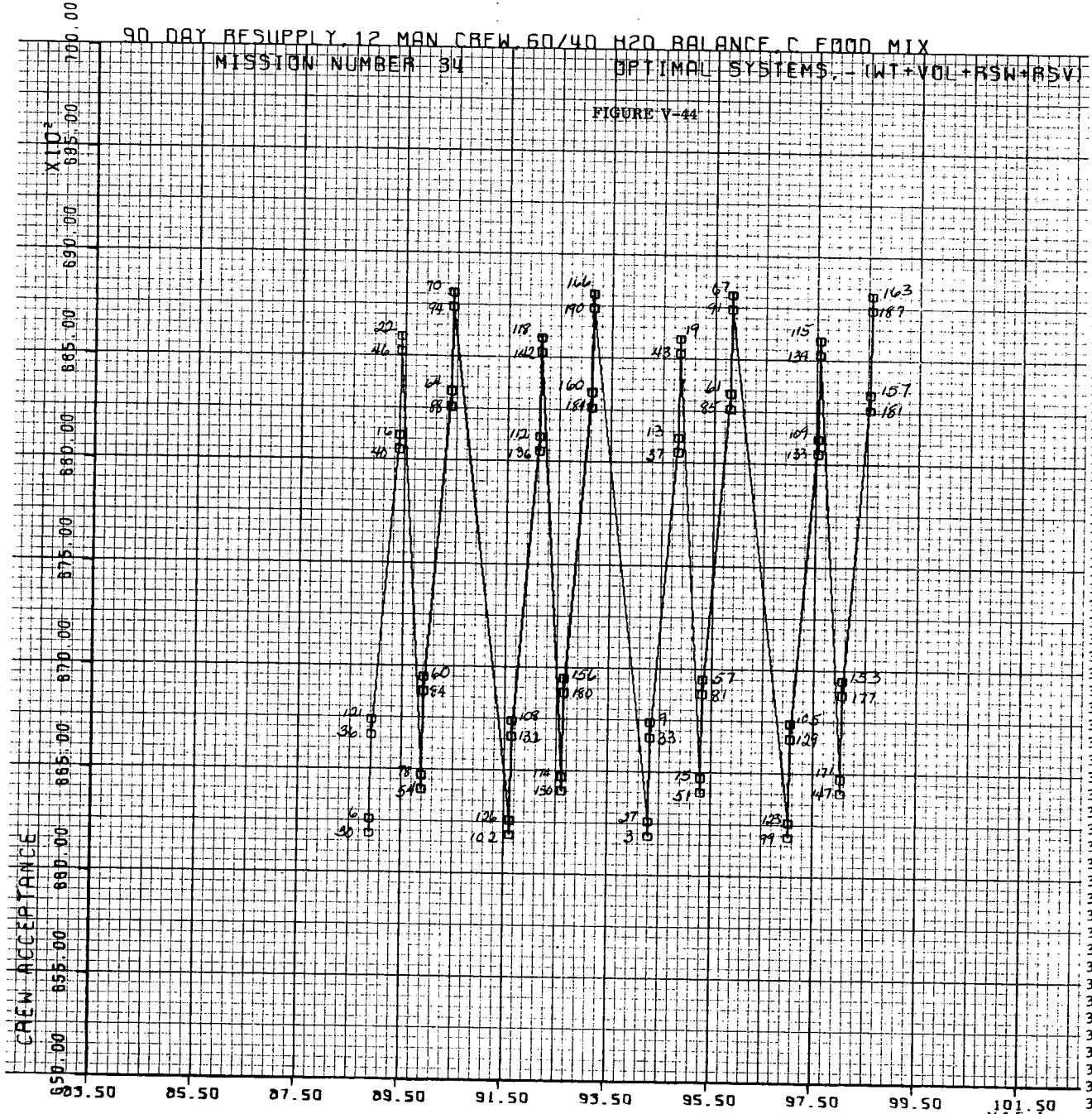
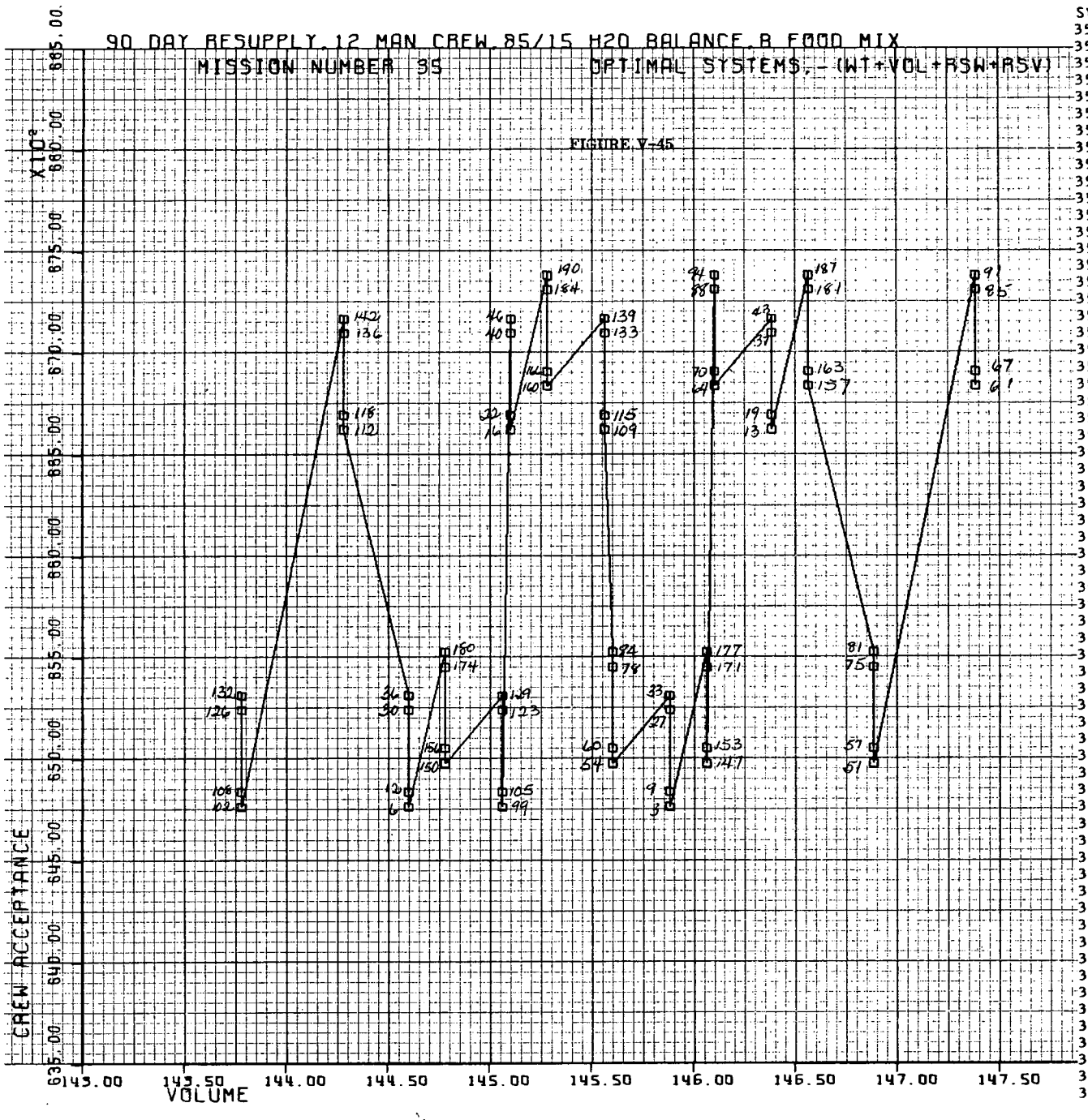
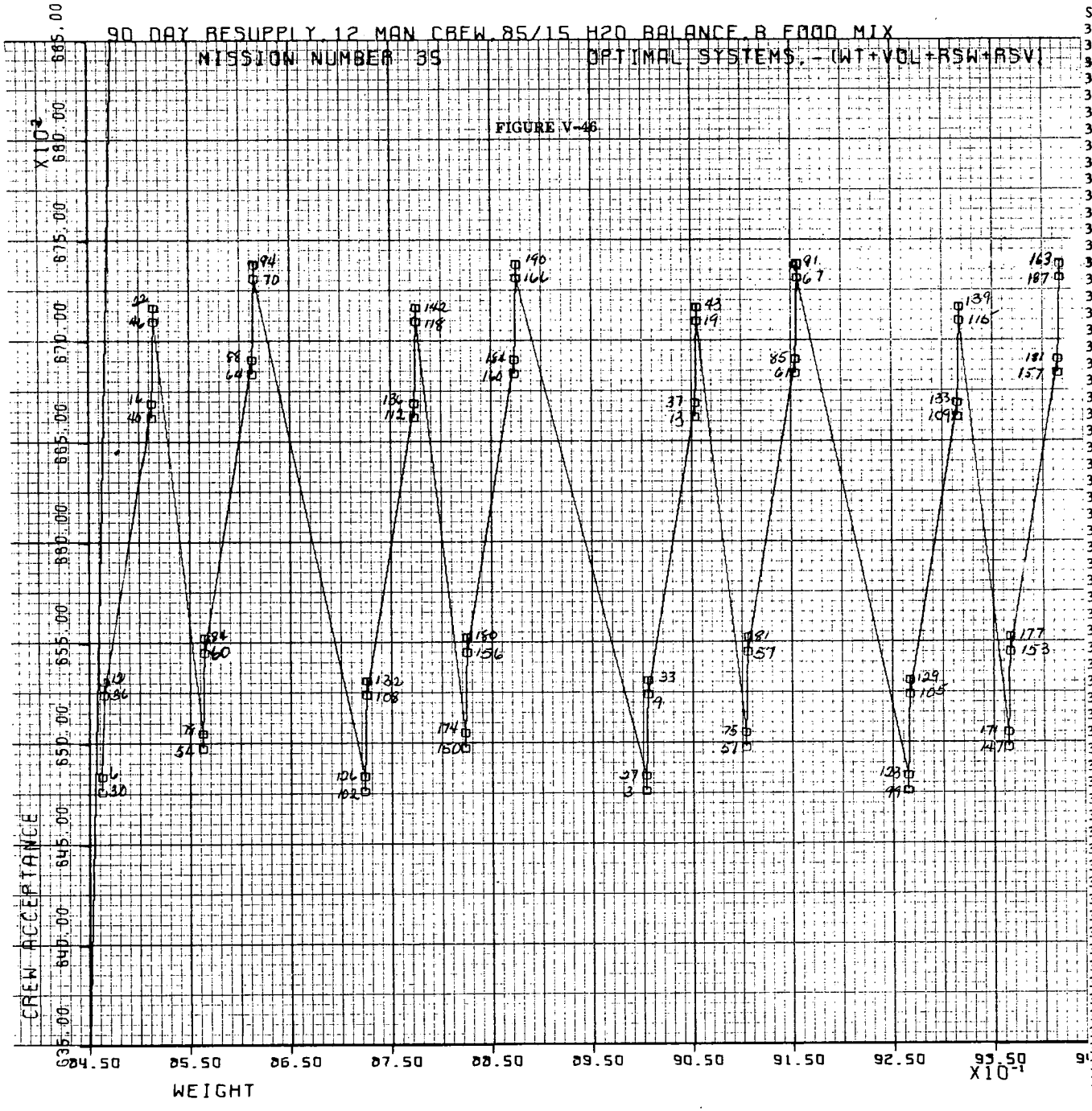


FIGURE V-44

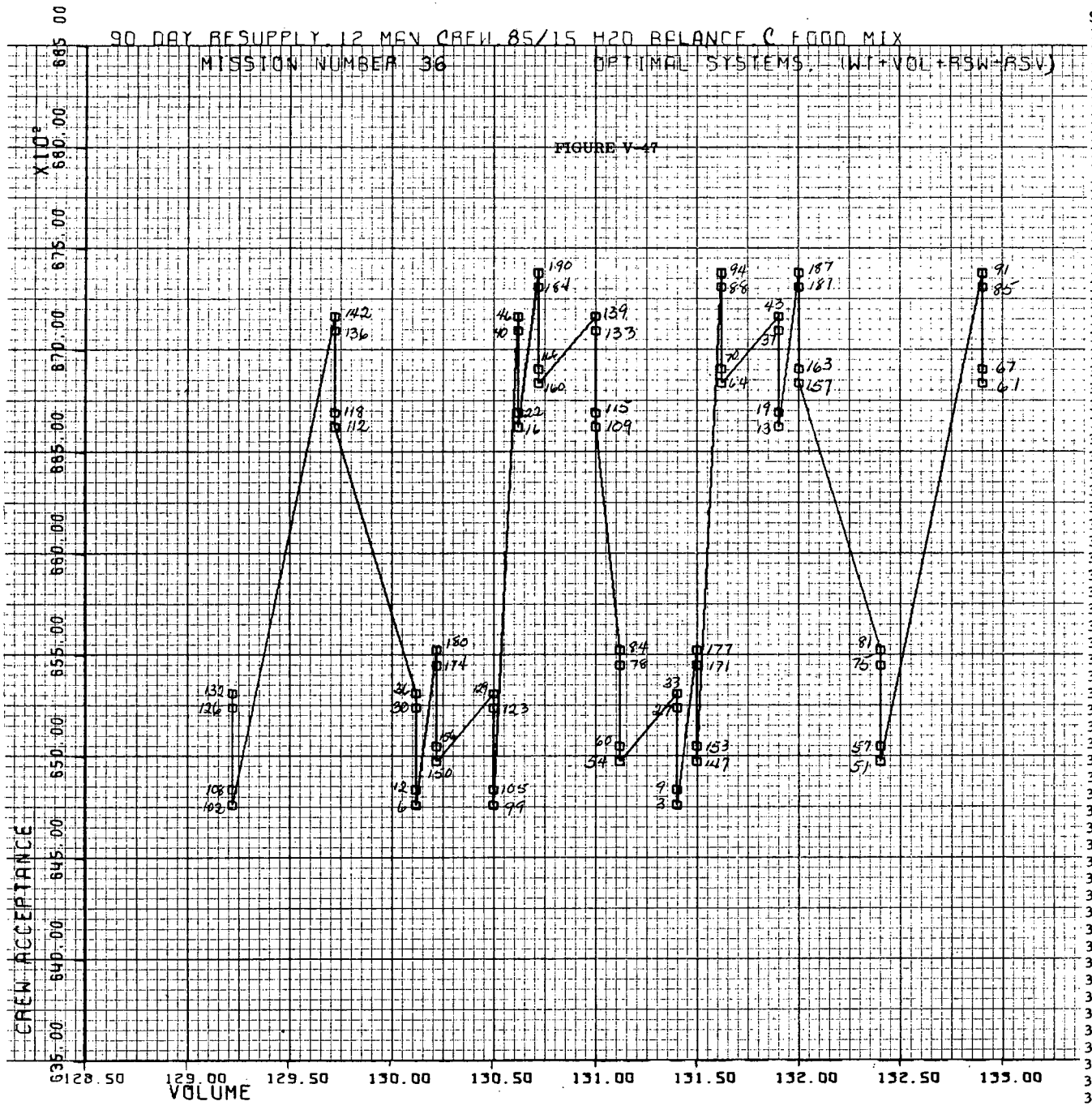
SYSTEM NR		COMPOSITION
34.	30	1, 7, 78,187,244,274,298
34.	6	1, 7, 79,187,244,274,298
34.	36	1, 7, 78,187,248,274,298
34.	12	1, 7, 79,187,248,274,298
34.	40	1, 7, 78,189,244,278,298
34.	16	1, 7, 79,189,244,278,298
34.	46	1, 7, 78,189,248,278,298
34.	22	1, 7, 79,189,248,278,298
34.	78	1, 7, 76,187,244,274,298
34.	54	1, 7, 77,187,244,274,298
34.	84	1, 7, 76,187,248,274,298
34.	60	1, 7, 77,187,248,274,298
34.	88	1, 7, 76,189,244,278,298
34.	64	1, 7, 77,189,244,278,298
34.	94	1, 7, 76,189,248,278,298
34.	70	1, 7, 77,189,248,278,298
34.	126	1, 5, 78,187,244,274,298
34.	102	1, 5, 79,187,244,274,298
34.	132	1, 5, 78,187,248,274,298
34.	108	1, 5, 79,187,248,274,298
34.	136	1, 5, 78,189,244,278,298
34.	112	1, 5, 79,189,244,278,298
34.	142	1, 5, 78,189,248,278,298
34.	118	1, 5, 79,189,248,278,298
34.	174	1, 5, 76,187,244,274,298
34.	150	1, 5, 77,187,244,274,298
34.	180	1, 5, 76,187,248,274,298
34.	156	1, 5, 77,187,248,274,298
34.	184	1, 5, 76,189,244,278,298
34.	160	1, 5, 77,189,244,278,298
34.	190	1, 5, 76,189,248,278,298
34.	166	1, 5, 77,189,248,278,298
34.	27	1, 7, 78,187,244,280,298
34.	3	1, 7, 79,187,244,280,298
34.	33	1, 7, 78,187,248,280,298
34.	9	1, 7, 79,187,248,280,298
34.	37	1, 7, 78,189,244,284,298
34.	13	1, 7, 79,189,244,284,298
34.	43	1, 7, 78,189,248,284,298
34.	19	1, 7, 79,189,248,284,298
34.	75	1, 7, 76,187,244,280,298
34.	51	1, 7, 77,187,244,280,298
34.	81	1, 7, 76,187,248,280,298
34.	57	1, 7, 77,187,248,280,298
34.	85	1, 7, 76,189,244,284,298
34.	61	1, 7, 77,189,244,284,298
34.	91	1, 7, 76,189,248,284,298
34.	67	1, 7, 77,189,248,284,298
34.	123	1, 5, 78,187,244,280,298
34.	99	1, 5, 79,187,244,280,298
34.	129	1, 5, 78,187,248,280,298
34.	105	1, 5, 79,187,248,280,298
34.	133	1, 5, 78,189,244,284,298
34.	109	1, 5, 79,189,244,284,298
34.	139	1, 5, 78,189,248,284,298
34.	115	1, 5, 79,189,248,284,298
34.	171	1, 5, 76,187,244,280,298
34.	147	1, 5, 77,187,244,280,298
34.	177	1, 5, 76,187,248,280,298
34.	153	1, 5, 77,187,248,280,298
34.	181	1, 5, 76,189,244,284,298
34.	157	1, 5, 77,189,244,284,298
34.	187	1, 5, 76,189,248,284,298
34.	163	1, 5, 77,189,248,284,298



SYSTEM NR		COMPOSITION
35.	132	1, 5, 78,187,248,274,298
35.	126	1, 5, 78,187,244,274,298
35.	108	1, 5, 79,187,248,274,298
35.	102	1, 5, 79,187,244,274,298
35.	142	1, 5, 78,189,248,278,298
35.	136	1, 5, 78,189,244,278,298
35.	118	1, 5, 79,189,248,278,298
35.	112	1, 5, 79,189,244,278,298
35.	36	1, 7, 78,187,248,274,298
35.	30	1, 7, 78,187,244,274,298
35.	12	1, 7, 79,187,248,274,298
35.	6	1, 7, 79,187,244,274,298
35.	180	1, 5, 76,187,248,274,298
35.	174	1, 5, 76,187,244,274,298
35.	156	1, 5, 77,187,248,274,298
35.	150	1, 5, 77,187,244,274,298
35.	129	1, 5, 78,187,248,280,298
35.	123	1, 5, 78,187,244,280,298
35.	105	1, 5, 79,187,248,280,298
35.	99	1, 5, 79,187,244,280,298
35.	46	1, 7, 78,189,248,278,298
35.	40	1, 7, 78,189,244,278,298
35.	22	1, 7, 79,189,248,278,298
35.	16	1, 7, 79,189,244,278,298
35.	190	1, 5, 76,189,248,278,298
35.	184	1, 5, 76,189,244,278,298
35.	166	1, 5, 77,189,248,278,298
35.	160	1, 5, 77,189,244,278,298
35.	139	1, 5, 78,189,248,284,298
35.	133	1, 5, 78,189,244,284,298
35.	115	1, 5, 79,189,248,284,298
35.	109	1, 5, 79,189,244,284,298
35.	84	1, 7, 76,187,248,274,298
35.	78	1, 7, 76,187,244,274,298
35.	60	1, 7, 77,187,248,274,298
35.	54	1, 7, 77,187,244,274,298
35.	33	1, 7, 78,187,248,280,298
35.	27	1, 7, 78,187,244,280,298
35.	9	1, 7, 79,187,248,280,298
35.	3	1, 7, 79,187,244,280,298
35.	177	1, 5, 76,187,248,280,298
35.	171	1, 5, 76,187,244,280,298
35.	153	1, 5, 77,187,248,280,298
35.	147	1, 5, 77,187,244,280,298
35.	94	1, 7, 76,189,248,278,298
35.	88	1, 7, 76,189,244,278,298
35.	70	1, 7, 77,189,248,278,298
35.	64	1, 7, 77,189,244,278,298
35.	43	1, 7, 78,189,248,284,298
35.	37	1, 7, 78,189,244,284,298
35.	19	1, 7, 79,189,248,284,298
35.	13	1, 7, 79,189,244,284,298
35.	187	1, 5, 76,189,248,284,298
35.	181	1, 5, 76,189,244,284,298
35.	163	1, 5, 77,189,248,284,298
35.	157	1, 5, 77,189,244,284,298
35.	81	1, 7, 76,187,248,280,298
35.	75	1, 7, 76,187,244,280,298
35.	57	1, 7, 77,187,248,280,298
35.	51	1, 7, 77,187,244,280,298
35.	91	1, 7, 76,189,248,284,298
35.	85	1, 7, 76,189,244,284,298
35.	67	1, 7, 77,189,248,284,298
35.	61	1, 7, 77,189,244,284,298



SYSTEM NR		COMPOSITION
35.	30	1, 7, 78,187,244,274,298
35.	6	1, 7, 79,187,244,274,298
35.	36	1, 7, 78,187,248,274,298
35.	12	1, 7, 79,187,248,274,298
35.	40	1, 7, 78,189,244,278,298
35.	16	1, 7, 79,189,244,278,298
35.	46	1, 7, 78,189,248,278,298
35.	22	1, 7, 79,189,248,278,298
35.	78	1, 7, 76,187,244,274,298
35.	54	1, 7, 77,187,244,274,298
35.	84	1, 7, 76,187,248,274,298
35.	60	1, 7, 77,187,248,274,298
35.	88	1, 7, 76,189,244,278,298
35.	64	1, 7, 77,189,244,278,298
35.	94	1, 7, 76,189,248,278,298
35.	70	1, 7, 77,189,248,278,298
35.	126	1, 5, 78,187,244,274,298
35.	102	1, 5, 79,187,244,274,298
35.	132	1, 5, 78,187,248,274,298
35.	108	1, 5, 79,187,248,274,298
35.	136	1, 5, 78,189,244,278,298
35.	112	1, 5, 79,189,244,278,298
35.	142	1, 5, 78,189,248,278,298
35.	118	1, 5, 79,189,248,278,298
35.	174	1, 5, 76,187,244,274,298
35.	150	1, 5, 77,187,244,274,298
35.	180	1, 5, 76,187,248,274,298
35.	156	1, 5, 77,187,248,274,298
35.	184	1, 5, 76,189,244,278,298
35.	160	1, 5, 77,189,244,278,298
35.	190	1, 5, 76,189,248,278,298
35.	166	1, 5, 77,189,248,278,298
35.	27	1, 7, 78,187,244,280,298
35.	3	1, 7, 79,187,244,280,298
35.	33	1, 7, 78,187,248,280,298
35.	9	1, 7, 79,187,248,280,298
35.	37	1, 7, 78,189,244,284,298
35.	13	1, 7, 79,189,244,284,298
35.	43	1, 7, 78,189,248,284,298
35.	19	1, 7, 79,189,248,284,298
35.	75	1, 7, 76,187,244,280,298
35.	51	1, 7, 77,187,244,280,298
35.	81	1, 7, 76,187,248,280,298
35.	57	1, 7, 77,187,248,280,298
35.	85	1, 7, 76,189,244,284,298
35.	61	1, 7, 77,189,244,284,298
35.	91	1, 7, 76,189,248,284,298
35.	67	1, 7, 77,189,248,284,298
35.	123	1, 5, 78,187,244,280,298
35.	99	1, 5, 79,187,244,280,298
35.	129	1, 5, 78,187,248,280,298
35.	105	1, 5, 79,187,248,280,298
35.	133	1, 5, 78,189,244,284,298
35.	109	1, 5, 79,189,244,284,298
35.	139	1, 5, 78,189,248,284,298
35.	115	1, 5, 79,189,248,284,298
35.	171	1, 5, 76,187,244,280,298
35.	147	1, 5, 77,187,244,280,298
35.	177	1, 5, 76,187,248,280,298
35.	153	1, 5, 77,187,248,280,298
35.	181	1, 5, 76,189,244,284,298
35.	157	1, 5, 77,189,244,284,298
35.	187	1, 5, 76,189,248,284,298
35.	163	1, 5, 77,189,248,284,298



SYSTEM NR		COMPOSITION
36.	132	1, 5, 78,187,248,274,298
36.	126	1, 5, 78,187,244,274,298
36.	108	1, 5, 79,187,248,274,298
36.	102	1, 5, 79,187,244,274,298
36.	142	1, 5, 78,189,248,278,298
36.	136	1, 5, 78,189,244,278,298
36.	118	1, 5, 79,189,248,278,298
36.	112	1, 5, 79,189,244,278,298
36.	36	1, 7, 78,187,248,274,298
36.	30	1, 7, 78,187,244,274,298
36.	12	1, 7, 79,187,248,274,298
36.	6	1, 7, 79,187,244,274,298
36.	180	1, 5, 76,187,248,274,298
36.	174	1, 5, 76,187,244,274,298
36.	156	1, 5, 77,187,248,274,298
36.	150	1, 5, 77,187,244,274,298
36.	129	1, 5, 78,187,248,280,298
36.	123	1, 5, 78,187,244,280,298
36.	105	1, 5, 79,187,248,280,298
36.	99	1, 5, 79,187,244,280,298
36.	46	1, 7, 78,189,248,278,298
36.	40	1, 7, 78,189,244,278,298
36.	22	1, 7, 79,189,248,278,298
36.	16	1, 7, 79,189,244,278,298
36.	190	1, 5, 76,189,248,278,298
36.	184	1, 5, 76,189,244,278,298
36.	166	1, 5, 77,189,248,278,298
36.	160	1, 5, 77,189,244,278,298
36.	139	1, 5, 78,189,248,284,298
36.	133	1, 5, 78,189,244,284,298
36.	115	1, 5, 79,189,248,284,298
36.	109	1, 5, 79,189,244,284,298
36.	84	1, 7, 76,187,248,274,298
36.	78	1, 7, 76,187,244,274,298
36.	60	1, 7, 77,187,248,274,298
36.	54	1, 7, 77,187,244,274,298
36.	33	1, 7, 78,187,248,280,298
36.	27	1, 7, 78,187,244,280,298
36.	9	1, 7, 79,187,248,280,298
36.	3	1, 7, 79,187,244,280,298
36.	177	1, 5, 76,187,248,280,298
36.	171	1, 5, 76,187,244,280,298
36.	153	1, 5, 77,187,248,280,298
36.	147	1, 5, 77,187,244,280,298
36.	94	1, 7, 76,189,248,278,298
36.	88	1, 7, 76,189,244,278,298
36.	70	1, 7, 77,189,248,278,298
36.	64	1, 7, 77,189,244,278,298
36.	43	1, 7, 78,189,248,284,298
36.	37	1, 7, 78,189,244,284,298
36.	19	1, 7, 79,189,248,284,298
36.	13	1, 7, 79,189,244,284,298
36.	187	1, 5, 76,189,248,284,298
36.	181	1, 5, 76,189,244,284,298
36.	163	1, 5, 77,189,248,284,298
36.	157	1, 5, 77,189,244,284,298
36.	81	1, 7, 76,187,248,280,298
36.	75	1, 7, 76,187,244,280,298
36.	57	1, 7, 77,187,248,280,298
36.	51	1, 7, 77,187,244,280,298
36.	91	1, 7, 76,189,248,284,298
36.	85	1, 7, 76,189,244,284,298
36.	67	1, 7, 77,189,248,284,298
36.	61	1, 7, 77,189,244,284,298

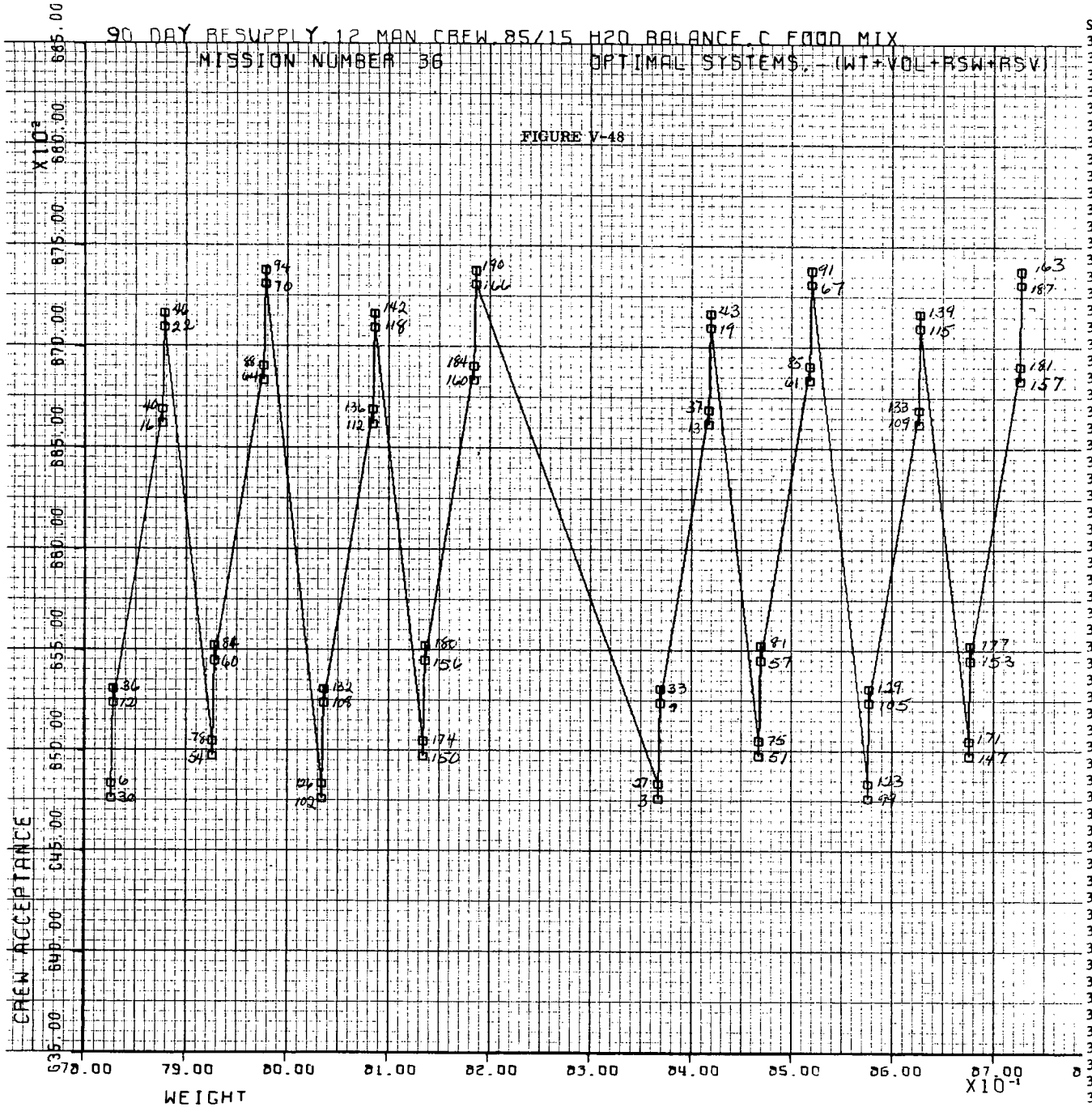


FIGURE V-48

SYSTEM NR		COMPOSITION
36.	30	1, 7, 78,187,244,274,298
36.	6	1, 7, 79,187,244,274,298
36.	36	1, 7, 78,187,248,274,298
36.	12	1, 7, 79,187,248,274,298
36.	40	1, 7, 78,189,244,278,298
36.	16	1, 7, 79,189,244,278,298
36.	46	1, 7, 78,189,248,278,298
36.	22	1, 7, 79,189,248,278,298
36.	78	1, 7, 76,187,244,274,298
36.	54	1, 7, 77,187,244,274,298
36.	84	1, 7, 76,187,248,274,298
36.	60	1, 7, 77,187,248,274,298
36.	88	1, 7, 76,189,244,278,298
36.	64	1, 7, 77,189,244,278,298
36.	94	1, 7, 76,189,248,278,298
36.	70	1, 7, 77,189,248,278,298
36.	126	1, 5, 78,187,244,274,298
36.	102	1, 5, 79,187,244,274,298
36.	132	1, 5, 78,187,248,274,298
36.	108	1, 5, 79,187,248,274,298
36.	136	1, 5, 78,189,244,278,298
36.	112	1, 5, 79,189,244,278,298
36.	142	1, 5, 78,189,248,278,298
36.	118	1, 5, 79,189,248,278,298
36.	174	1, 5, 76,187,244,274,298
36.	150	1, 5, 77,187,244,274,298
36.	180	1, 5, 76,187,248,274,298
36.	156	1, 5, 77,187,248,274,298
36.	184	1, 5, 76,189,244,278,298
36.	160	1, 5, 77,189,244,278,298
36.	190	1, 5, 76,189,248,278,298
36.	166	1, 5, 77,189,248,278,298
36.	27	1, 7, 78,187,244,280,298
36.	3	1, 7, 79,187,244,280,298
36.	33	1, 7, 78,187,248,280,298
36.	9	1, 7, 79,187,248,280,298
36.	37	1, 7, 78,189,244,284,298
36.	13	1, 7, 79,189,244,284,298
36.	43	1, 7, 78,189,248,284,298
36.	19	1, 7, 79,189,248,284,298
36.	75	1, 7, 76,187,244,280,298
36.	51	1, 7, 77,187,244,280,298
36.	81	1, 7, 76,187,248,280,298
36.	57	1, 7, 77,187,248,280,298
36.	85	1, 7, 76,189,244,284,298
36.	61	1, 7, 77,189,244,284,298
36.	91	1, 7, 76,189,248,284,298
36.	67	1, 7, 77,189,248,284,298
36.	123	1, 5, 78,187,244,280,298
36.	99	1, 5, 79,187,244,280,298
36.	129	1, 5, 78,187,248,280,298
36.	105	1, 5, 79,187,248,280,298
36.	133	1, 5, 78,189,244,284,298
36.	109	1, 5, 79,189,244,284,298
36.	139	1, 5, 78,189,248,284,298
36.	115	1, 5, 79,189,248,284,298
36.	171	1, 5, 76,187,244,280,298
36.	147	1, 5, 77,187,244,280,298
36.	177	1, 5, 76,187,248,280,298
36.	153	1, 5, 77,187,248,280,298
36.	181	1, 5, 76,189,244,284,298
36.	157	1, 5, 77,189,244,284,298
36.	187	1, 5, 76,189,248,284,298
36.	163	1, 5, 77,189,248,284,298

APPENDIX

Program Listing

The following FORTRAN listings correspond to the basic, evaluation and plot models described in this volume.

```
          FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
C
C     MAIN - FOOD SYSTEM DESIGN PROGRAM
C
C     THE TERM 'CONCEPT' USED INTERNALLY WITHIN THE PROGRAM IS REFERRED
C     TO AS 'FUNCTIONAL SUB-SYSTEM' IN PRINTED OUTPUT DATA
C
      INTEGER*2 INTFCE,IZRO,IDMSTR,IDMM,IDEQ,IEP1,IEP2,IRECEQ
      COMMON/SPACE/CNCPCH(17,300),IFCNCP(7,300),IEPLST(2,900)
      COMMON/IDM/IDMSTR(300,25)
      COMMON/DPTHIN/NFCNCP(7),FACTR(17),IPNSYS,NDPTH
      COMMON/DPTOUT/NDPTCL(7)
      DIMENSION MISSN(18),IX(10),IDUM(60),DESCA(10),DESCX(36),
     1EQPTCH(17,200),DUMEQ(6),IEQXCR(17),
     2JJ(7),VEC(17),
     3INTFCE(300,300),IPRVAL(50,2)
      DIMENSION DMEQ(17),IRECEQ(800),IEQDES(200),EQPNAM(4,200),
     1TABOUT(14),IDMM(25)
      DIMENSION SYSTL1(16),SYSTL2(16)
      DIMENSION IORDCN(7,200)
      EQUIVALENCE (IORDCN(1,1),IEPLST(1,1))
      DATA DESCA/'ACCEPTANCE  WEIGHT  VOLUME  POWER   COST'/
      DATA DESCX/'RELIABILITY     MAINTAINABILITY AVAILABILITY    SAFETY
     1           RESUPPL WT + VOLENERGY           CREW REQTS      WATER RE
     2QTS      DEVELOPMENT RISK'/
      DATA IEQXCR/5*0,1,1,2,4,5,5,6,7,8,8,9,3/
      DATA BLANK/'     '/
      IZRO=0
      IFIRST=0
      NDPSET=2
      REWIND 1
      DO 1 I=1,17
      DO 1 J=1,200
    1 EQPTCH(I,J)=0.0
      DO 2 I=1,300
      DO 2 J=1,25
    2 IDMSTR(I,J)=0
      DO 3 I=1,50
      DO 3 J=1,2
    3 IPRVAL(I,J)=0
      DO 4 I=1,200
      IEQDES(I)=0
      DO 4 J=1,4
    4 EQPNAM(J,I)=BLANK
      READ(5,310)IPNTG,IPPAIR,IPSYS,IPNSYS,IPEQ,IPCNC,IPSOUT
      IPSOUT=1
    5 READ(5,300)(MISSN(I),I=1,18)
      READ(5,310)NRCASE
      REWIND 3
```

```
      DO 8 I=1,300
      DO 8 J=1,300
    8 INTFCE(I,J)=0
      DO 9 I=1,14
    9 TABOUT(I)=0.0
      INDSYS=0
      NSYSUM=0
      WRITE(6,400)
      CALL NOTES(IPSOUT)
      WRITE(6,400)
      WRITE(6,404)
      WRITE(6,300)(MISSN(I),I=1,18)
      WRITE(6,305)NRCASE
      KKK=0
      WRITE(1)KKK,(MISSN(I),I=1,18)
      DO 10 I=1,10
   10 IX(I)=0
      READ(5,330)NX,(IDUM(I),I=1,10)
      DO 15 I=1,NX
      II=IDUM(I)
      IX(II)=1
   15 CONTINUE
      WRITE(6,405)
      WRITE(6,414)(DESCA(I),I=1,3)
      WRITE(6,412)(DESCA(I),I=4,5)
      WRITE(6,412)(DESCA(I),I=6,7)
      WRITE(6,412)(DESCA(I),I=8,9)
      WRITE(6,410)DESCA(10)
      DO 20 I=1,9
      IF(IX(I).NE.0) GO TO 20
      JST=4*(I-1)+1
      JND=4*I
      WRITE(6,415)(DESCX(J),J=JST,JND)
   20 CONTINUE
      WRITE(1)KKK,(IX(I),I=1,10),NRCASE,(IDUM(I),I=1,7)
C
C     IF IX(J) = 0, OPTIONAL EQPT CHARAC NR J IS COMPUTED IN RUN
C     IF IX(J) = 1, OPTIONAL EQPT CHARAC NR J IS NOT COMPUTED IN RUN
C     WHERE      J=1    IS    RELIABILITY
C     WHERE      J=2    IS    MAINTAINABILITY
C     WHERE      J=3    IS    AVAILABILITY
C     WHERE      J=4    IS    SAFETY
C     WHERE      J=5    IS    RESUPPLY  WT  AND  VOLUME
C     WHERE      J=6    IS    ENERGY
C     WHERE      J=7    IS    CREW REQUIREMENTS
C     WHERE      J=8    IS    WATER REQUIREMENTS
C     WHERE      J=9    IS    DEVELOPMENT RISK
C
```

FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

```
      WRITE(6,401)
      READ(5,310)NEQPS
      WRITE(6,417)NEQPS
      IEQCNT=0
   23 READ(5,316)IEQ,ICRD,(DMEQ(I),I=1,17)
      WRITE(3,316)IEQ,ICRD,(DMEQ(I),I=1,17)
      IEQCNT=IEQCNT+1
      IF(IPEQ.EQ.0) GO TO 24
      WRITE(6,850)IEQ,ICRD,(DMEQ(I),I=1,17)
      WRITE(6,855)IEQCNT
   24 CONTINUE
      IRECEQ(IEQCNT)=0
      IF(IEQ.LE.0)GO TO 25
      IF(ICRD.NE.4) GO TO 23
      IRECEQ(IEQCNT)=1
      GO TO 23
   25 CONTINUE
      REWIND 3
      NEQCNT=IEQCNT
      IF(IPEQ.NE.0) WRITE(6,860) NEQCNT,(J,IRECEQ(J),J=1,NEQCNT)
      IEQCNT=0
   30 CONTINUE
      IEQCNT=IEQCNT+1
      IF(IPEQ.NE.0) WRITE(6,865) IEQCNT,IRECEQ(IEQCNT)
      IF(IRECEQ(IEQCNT).EQ.IZRO) GO TO 32
      READ(3,317)IEQ,ICRD,(IDUM(I),I=1,4),(DUMEQ(I),I=1,4)
      IEQDES(IEQ)=IDUM(1)*(10**6)+IDUM(2)*(10**4)+IDUM(3)*(10**2)
     1+IDUM(4)
      DO 31 I=1,4
   31 EQPNAM(I,IEQ)=DUMEQ(I)
      GO TO 30
   32 CONTINUE
      READ(3,315)IEQ,ICRD,(DUMEQ(I),I=1,6)
      IF (IEQ.LE.0) GO TO 50
      IF(ICRD.LT.1.OR.ICRD.GT.3) GO TO 49
      GO TO (35,40,45),ICRD
   35 DO 37 I=2,6
      II=I-1
      EQPTCH(II,IEQ)=DUMEQ(I)
   37 CONTINUE
      EQPTCH(17,IEQ)=DUMEQ(1)
      GO TO 30
   40 DO 42 I=1,6
      II=I+5
      EQPTCH(II,IEQ)=DUMEQ(I)
   42 CONTINUE
      EQDUM=EQPTCH(8,IEQ)
      IF(EQDUM.NE.0.0) EQPTCH(8,IEQ)=1.0/EQDUM
```

```
      GO TO 30
   45 DO 47 I=1,5
      II=I+11
      EQPTCH(II,IEQ)=DUMEQ(I)
   47 CONTINUE
      GO TO 30
   49 CONTINUE
      WRITE(6,420)ICRD
      GO TO 295
   50 CONTINUE
C
C     FOR EQUIPMENT NUMBER J,
C           EQPTCH( 1,J) IS  ACCEPTANCE MEASURE
C           EQPTCH( 2,J) IS  WEIGHT
C           EQPTCH( 3,J) IS  VOLUME
C           EQPTCH( 4,J) IS  POWER
C           EQPTCH( 5,J) IS  COST
C           EQPTCH( 6,J) IS  FAILURE RATE
C           EQPTCH( 7,J) IS  OPERATING TIME
C           EQPTCH( 8,J) IS  MAINTAINABILITY MEASURE (MU INVERSE)
C           EQPTCH( 9,J) IS  SAFETY MEASURE
C           EQPTCH(10,J) IS  RESUPPLY WEIGHT
C           EQPTCH(11,J) IS  RESUPPLY VOLUME
C           EQPTCH(12,J) IS  ENERGY
C           EQPTCH(13,J) IS  CREW REQUIREMENTS
C           EQPTCH(14,J) IS  HOT WATER REQUIREMENTS
C           EQPTCH(15,J) IS  COLD WATER REQUIREMENTS
C           EQPTCH(16,J) IS  DEVELOPMENT RISK
C           EQPTCH(17,J) IS ASSOCIATED FUNCTION.
C
      IF(IPEQ.EQ.0) GO TO 5400
      WRITE(6,425)
      DO 54 I=1,NEQPS
      WRITE(6,430)I,EQPTCH(17,I)
      DO 53 J=1,16
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 52
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 52
      WRITE(6,435) J
      GO TO 53
   52 WRITE(6,440) J,EQPTCH(J,I)
   53 CONTINUE
      WRITE(6,402)
   54 CONTINUE
      WRITE(6,401)
 5400 CONTINUE
      IWRT=0
```

```
      DO 5410 J=1,16
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 5410
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 5410
      II=J
      IF(J.GE.6) II=J-2
      TABOUT(II)=1.E20
5410  CONTINUE
      DO 5450 I=1,NEQPS
      IWRT=MOD(IWRT,18)
      IF(IWRT.NE.0) GO TO 5420
      WRITE(6,720)
      WRITE(6,760)NRCASE,(MISSN(J),J=1,18)
      WRITE(6,730)
      WRITE(6,401)
      WRITE(6,600)
      WRITE(6,610)
      WRITE(6,402)
5420  CONTINUE
      IWRT=IWRT+1
      IFUNCN=EQPTCH(17,I)
      IPOWRR=EQPTCH(4,I)
      ICOST=EQPTCH(5,I)
      DO 5430 J=1,3
5430  TABOUT(J)=EQPTCH(J,I)
      DO 5440 J=4,14
      IF(TABOUT(J).GT.1.E19)GO TO 5440
      II=J+2
      TABOUT(J)=EQPTCH(II,I)
      IF(J.EQ.6.AND.TABOUT(J).NE.0.0) TABOUT(J)=1./TABOUT(J)
      IF(J.EQ.7) TABOUT(J)=TABOUT(J)*(10.**5)
5440  CONTINUE
      IOPTME=TABOUT(5)
      IEQDMY=IEQDES(I)
      IDUM(1)=IEQDMY/(10**6)
      IEQDMY=IEQDMY-IDUM(1)*(10**6)
      IDUM(2)=IEQDMY/(10**4)
      IEQDMY=IEQDMY-IDUM(2)*(10**4)
      IDUM(3)=IEQDMY/(10**2)
      IDUM(4)=IEQDMY-IDUM(3)*(10**2)
      WRITE(6,620)I,(EQPNAM(J,I),J=1,4),IFUNCN,(TABOUT(J),J=1,3),
     1IPOWRR,ICOST,TABOUT(4),IOPTME,(TABOUT(J),J=6,14)
      WRITE(6,630)(IDUM(J),J=1,4)
5450  CONTINUE
      IPFSB=1
      CALL FSBSYS(IFIRST,NCNCPS,IPFSB)
      WRITE(6,441) NCNCPS
```

```
      DO 60 I=1,NCNCPS
      DO 57 J=1,17
   57 CNCPCH(J,I)=0.0
      CNCPCH(7,I)=1.0
      CNCPCH(16,I)=1.0
   60 CONTINUE
      DO 7610 IC=1,300
      IF (IDMSTR(IC,1).EQ.0) GO TO 7610
      ICNCPT=IC
      DO 6115 J=1,25
      IDMM(J)=IDMSTR(IC,J)
 6115 CONTINUE
      NMUCNT=0
      IF(IPCNC.NE.0) WRITE(6,442)ICNCPT
      DO 70 I=1,20
      IF(IDMM(I).EQ.IZRO) GO TO 75
      IF(IPCNC.NE.0) WRITE(6,443)IDMM(I)
      IDEQ=IDMM(I)
      IF(I.GT.1) GO TO 62
      CNCPCH(17,ICNCPT)=EQPTCH(17,IDEQ)
      GO TO 63
   62 IF(CNCPCH(17,ICNCPT).NE.EQPTCH(17,IDEQ)) GO TO 77
   63 CONTINUE
      DO 65 J=1,15
      IF(J.EQ.7) GO TO 65
      CNCPCH(J,ICNCPT)=CNCPCH(J,ICNCPT)+EQPTCH(J,IDEQ)
   65 CONTINUE
      IF(EQPTCH(8,IDEQ).NE.0.0) NMUCNT=NMUCNT+1
      ELMDT=EQPTCH(6,IDEQ)*EQPTCH(7,IDEQ)
      REL=EXP(-ELMDT)
      CNCPCH(7,ICNCPT)=CNCPCH(7,ICNCPT)*REL
      CNCPCH(16,ICNCPT)=CNCPCH(16,ICNCPT)*EQPTCH(16,IDEQ)
   70 CONTINUE
   75 CONTINUE
      EN=I-1
      IF(NMUCNT.EQ.0) GO TO 76
      ENMU=NMUCNT
      CNCPCH(8,ICNCPT)=CNCPCH(8,ICNCPT)/ENMU
   76 CONTINUE
      CNCPCH(1,ICNCPT)=CNCPCH(1,ICNCPT)/EN
 7610 CONTINUE
      GO TO 80
   77 WRITE(6,444)ICNCPT
      GO TO 295
   80 CONTINUE
C
C     FOR CONCEPT NUMBER J,
C         CNCPCH( 1,J) IS  ACCEPTANCE MEASURE
```

```
          FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
                       (CONTINUED)
C         CNCPCH( 2,J) IS  WEIGHT
C         CNCPCH( 3,J) IS  VOLUME
C         CNCPCH( 4,J) IS POWER
C         CNCPCH( 5,J) IS  COST
C         CNCPCH( 6,J) IS  FAILURE RATE
C         CNCPCH( 7,J) IS  RELIABILITY
C         CNCPCH( 8,J) IS  MAINTAINABILITY MEASURE (MU INVERSE)
C         CNCPCH( 9,J) IS  SAFETY MEASURE
C         CNCPCH(10,J) IS  RESUPPLY WEIGHT
C         CNCPCH(11,J) IS  RFSUPPLY VOLUME
C         CNCPCH(12,J) IS  ENERGY
C         CNCPCH(13,J) IS  CREW REQUIREMENTS
C         CNCPCH(14,J) IS  HOT  WATER REQUIREMENTS
C         CNCPCH(15,J) IS  COLD WATER REQUIREMENTS
C         CNCPCH(16,J) IS  DEVELOPMENT RISK
C         CNCPCH(17,J) IS  ASSOCIATED FUNCTION
C
      IF(IPCNC.EQ.0) GO TO 86
      WRITE(6,445)
      DO 85 I=1,NCNCPS
      WRITE(6,450)I,CNCPCH(17,I)
      DO 83 J=1,16
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 82
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 82
      WRITE(6,435) J
      GO TO 83
   82 WRITE(6,440) J,CNCPCH(J,I)
   83 CONTINUE
      WRITE(6,402)
   85 CONTINUE
      WRITE(6,401)
   86 CONTINUE
      IWRT=0
      DO 87 J=1,14
   87 TABOUT(J)=0.0
      DO 88 J=1,16
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 88
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 88
      II=J
      IF(J.GE.6) II=J-2
      TABOUT(II)=1.E20
   88 CONTINUE
      DO 9400 I=1,NCNCPS
      IF(IWRT.EQ.0) GO TO 8800
```

```
      IF(IWRT.LT.44) GO TO 89
 8800 CONTINUE
      IWRT=0
      WRITE(6,720)
      WRITE(6,760)NRCASE,(MISSN(J),J=1,18)
      WRITE(6,740)
      WRITE(6,401)
      WRITE(6,640)
      WRITE(6,650)
      WRITE(6,402)
   89 CONTINUE
      IWRT=IWRT+1
      IFUNCN=CNCPCH(17,I)
      IPOWRR=CNCPCH(4,I)
      ICOST=CNCPCH(5,I)
      DO 90 J=1,3
   90 TABOUT(J)=CNCPCH(J,I)
      DO 91 J=4,14
      IF(TABOUT(J).GT.1.E19) GO TO 91
      II=J+2
      TABOUT(J)=CNCPCH(II,I)
      IF(J.EQ.6.AND.TABOUT(J).NE.0) TABOUT(J)=1./TABOUT(J)
      IF(J.EQ.7) TABOUT(J)=TABOUT(J)*(10.**5)
   91 CONTINUE
      DO 92 J=1,20
      IF(IDMSTR(I,J).EQ.IZRO) GO TO 93
      IDMM(J)=IDMSTR(I,J)
   92 CONTINUE
      IDMMX=20
      GO TO 94
   93 IDMMX=J-1
   94 CONTINUE
      IF(IDMMX.EQ.0) IDMMX=1
      WRITE(6,660)NRCASE,I,IFUNCN,(TABOUT(J),J=1,3),IPOWRR,ICOST,
     1(TABOUT(J),J=4,14)
      WRITE(6,670)(IDMM(J),J=1,IDMMX)
      IDDDM=(IDMMX-1)/5
      IDDDM=IDDDM+1
      IWRT=IWRT+IDDDM
 9400 CONTINUE
      READ(5,310)NPAIRS
      WRITE(6,720)
      WRITE(6,535)NPAIRS
   95 CONTINUE
      READ(5,310)IPAIR,(IDUM(I),I=1,2)
      IF(IPAIR.EQ.0) GO TO 101
      WRITE(6,540)IPAIR,(IDUM(I),I=1,2)
      DO 100 J=1,2
```

```
      IPRVAL(IPAIR,J)=IDUM(J)
  100 CONTINUE
      GO TO 95
  101 CONTINUE
      IF(IPPAIR.NE.0) WRITE(6,545)
      IPRCNT=0
      IPC=0
  102 IPC=IPC+1
      DO 103 J=1,2
  103 IF(IPRVAL(IPC,J).LE.0) GO TO 109
      IEP1=IPRVAL(IPC,1)
      IEP2=IPRVAL(IPC,2)
      J1=0
      J2=0
      IC=0
  104 IC=IC+1
      DO 106 I=1,25
      IF(IDMSTR(IC,I).EQ.IZRO) GO TO 107
      IF(IDMSTR(IC,I).NE.IEP1) GO TO 105
      J1=J1+1
      IEPLST(1,J1)=IC
  105 IF(IDMSTR(IC,I).NE.IEP2) GO TO 106
      J2=J2+1
      IEPLST(2,J2)=IC
  106 CONTINUE
  107 CONTINUE
      IF(IC.LT.NCNCPS) GO TO 104
      IF((J1.EQ.0).OR.(J2.EQ.0)) GO TO 109
      DO 108 I=1,J1
      IC=IEPLST(1,I)
      DO 108 J=1,J2
      JC=IEPLST(2,J)
      IPRCNT=IPRCNT+1
      IF(IPPAIR.NE.0) WRITE(6,550)IPRCNT,IC,JC
      INTFCE(IC,JC)=1
      INTFCE(JC,IC)=1
  108 CONTINUE
  109 CONTINUE
      IF(IPC.LT.NPAIRS) GO TO 102
      WRITE(6,555)IPRCNT
      IF(IPNSYS.EQ.0) GO TO 111
      WRITE(6,455)
      DO 110 I=1,NCNCPS
      WRITE(6,460)I,(INTFCE(I,J),J=1,NCNCPS)
  110 CONTINUE
  111 CONTINUE
      DO 115 I=1,7
  115 NFCNCP(I)=0
```

```
      DO 120 I=1,NCNCPS
      IFNC=CNCPCH(17,I)
      IF(IFNC.LT.1.OR.IFNC.GT.7) GO TO 128
      NFCNCP(IFNC)=NFCNCP(IFNC)+1
      INN=NFCNCP(IFNC)
      IFCNCP(IFNC,INN)=I
      IF(IPNSYS.NE.0) WRITE(6,522)I,IFNC,NFCNCP(IFNC),IFCNCP(IFNC,INN)
  120 CONTINUE
      DO 125 I=1,7
      IF(NFCNCP(I).GT.0) GO TO 125
      WRITE(6,465)I,NFCNCP(I)
      GO TO 295
  125 CONTINUE
      GO TO 129
  128 WRITE(6,470)I,CNCPCH(17,I)
      GO TO 295
  129 CONTINUE
      KK=0
      READ(5,310)NSYSOR
      WRITE(1)NSYSOR,(IDUM(J),J=1,18)
      WRITE(6,770)NSYSOR
      ISYSOR=0
  130 ISYSOR=ISYSOR+1
      NDPTH=NDPSET
      READ(5,311)(FACTR(I),I=1,17)
      READ(5,301)(SYSTL1(I),I=1,16)
      READ(5,301)(SYSTL2(I),I=1,16)
      WRITE(1)ISYSOR,IDMMY,(FACTR(I),I=1,17)
      WRITE(6,780)ISYSOR,(I,FACTR(I),I=1,17)
      WRITE(6,790)(SYSTL1(I),I=1,16),(SYSTL2(I),I=1,16)
 1300 WRITE(6,800)NDPTH
      CALL DPTHCL
      KORSYS=0
      KKRSYS=0
      NFC1=NDPTCL(1)
      NFC2=NDPTCL(2)
      NFC3=NDPTCL(3)
      NFC4=NDPTCL(4)
      NFC5=NDPTCL(5)
      NFC6=NDPTCL(6)
      NFC7=NDPTCL(7)
      IF(IPNSYS.EQ.0)GO TO 1302
      WRITE(6,523)(NDPTCL(I),I=1,7)
      DO 1301 I=1,7
      NNN=NDPTCL(I)
      WRITE(6,525)I,(IORDCN(I,J),J=1,NNN)
 1301 CONTINUE
 1302 CONTINUE
```

```
      IF(IPSOUT.EQ.0) GO TO 1305
      IWRT=0
      DO 1303 J=1,13
 1303 TABOUT(J)=0.0
      DO 1304 J=7,17
      IF(J.EQ.8) GO TO 1304
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 1304
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 1304
      II=J-4
      IF(J.EQ.7) II=II+1
      TABOUT(II)=1.E20
 1304 CONTINUE
 1305 CONTINUE
      DO 160 I1=1,NFC1
      JJ(1)=IORDCN(1,I1)
      DO 160 I2=1,NFC2
      JJ(2)=IORDCN(2,I2)
      DO 160 I3=1,NFC3
      JJ(3)=IORDCN(3,I3)
      DO 160 I4=1,NFC4
      JJ(4)=IORDCN(4,I4)
      DO 160 I5=1,NFC5
      JJ(5)=IORDCN(5,I5)
      DO 160 I6=1,NFC6
      JJ(6)=IORDCN(6,I6)
      DO 160 I7=1,NFC7
      JJ(7)=IORDCN(7,I7)
      KK=KK+1
      KKRSYS=KKRSYS+1
      NSYSUM=NSYSUM+1
      IF(IPNSYS.EQ.0) GO TO 1306
      INDNSS=0
      NNNSYS=MOD(NSYSUM,IPNSYS)
      IF(NNNSYS.NE.0) GO TO 1306
      WRITE(6,560)NSYSUM,INDSYS,KK
      INDNSS=1
 1306 CONTINUE
      IF(IPNTG.NE.0) WRITE(6,530) KK,I1,I2,I3,I4,I5,I6,I7
      I=0
  131 I=I+1
      J=I
  132 J=J+1
      K=JJ(I)
      L=JJ(J)
      IF(INTFCE(K,L).NE.IZRO) GO TO 133
      IF(J.LT.7) GO TO 132
```

```
      IF(I.LT.6) GO TO 131
      GO TO 134
  133 CONTINUE
      IF(IPNTG.EQ.0) GO TO 160
      WRITE(6,480)KK,(I,JJ(I),I=1,7)
      WRITE(6,490)KK,K,L
      GO TO 160
  134 CONTINUE
      KORSYS=KORSYS+1
      IF(KORSYS.LE.1950) GO TO 1345
      NDPTH=NDPTH-1
      IF(NDPTH.GT.0) GO TO 1343
      WRITE(6,870)
      GO TO 165
 1343 CONTINUE
      KK=KK-KKRSYS
      WRITE(6,810)KORSYS
      GO TO 1300
 1345 CONTINUE
      INDSYS=INDSYS+1
      IF(IPNSYS.EQ.0) GO TO 1340
      IF(INDNSS.EQ.0) GO TO 1340
      WRITE(6,565)INDSYS
 1340 CONTINUE
      IF(IPSYS.EQ.0) GO TO 1341
      WRITE(6,480)KK,(I,JJ(I),I=1,7)
      WRITE(6,500)KK
 1341 CONTINUE
      DO 135 I=1,15
  135 VEC(I)=0.0
      VEC(7)=1.0
      VEC(16)=1.0
      IFF=0
      NMUC=0
  140 IFF=IFF+1
      JJJ=JJ(IFF)
      DO 145 I=1,15
      IF(I.EQ.7) GO TO 145
      VEC(I)=VEC(I)+CNCPCH(I,JJJ)
  145 CONTINUE
      VEC(7)=CNCPCH(7,JJJ)*VEC(7)
      VEC(16)=CNCPCH(16,JJJ)*VEC(16)
      IF(CNCPCH(8,JJJ).NE.0.0) NMUC=NMUC+1
      IF(IFF.LT.7) GO TO 140
      VEC(1)=VEC(1)/7.0
      IF(NMUC.EQ.0) GO TO 147
      ENMUC=NMUC
      VEC(8)=VEC(8)/ENMUC
```

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          FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
                        (CONTINUED)
      IF(VEC(8).EQ.0.0) GO TO 147
      VEC(8)=1.0/VEC(8)
  147 CONTINUE
      DENOM=VEC(6)+VEC(8)
      VEC(17)=0.0
      IF(DENOM.EQ.0.0) GO TO 150
      VEC(17)=VEC(8)/DENOM
  150 CONTINUE
C
C      FOR SYSTEM NUMBER KK,
C         VEC(1) IS  ACCEPTANCE MEASURE
C         VEC(2) IS  WEIGHT
C         VEC(3) IS  VOLUME
C         VEC(4) IS  POWER
C         VEC(5) IS  COST
C         VEC(6) IS  FAILURE RATE
C         VEC(7) IS  RELIABILITY
C         VEC(8) IS  MAINTAINABILITY MEASURE (MU)
C         VEC(9) IS  SAFETY MEASURE
C         VEC(10) IS  RESUPPLY WEIGHT
C         VEC(11) IS  RESUPPLY VOLUME
C         VEC(12) IS  ENERGY
C         VEC(13) IS  CREW REQUIREMENTS
C         VEC(14) IS  HOT  WATER REQUIREMENTS
C         VEC(15) IS  COLD WATER REQUIREMENTS
C         VEC(16) IS  DEVELOPMENT RISK
C         VEC(17) IS  AVAILABILITY MEASURE
C
      IF(IPSYS.EQ.0) GO TO 156
      WRITE(6,510)KK
      DO 155 I=1,17
      IXIND=IEQXCR(I)
      IF(IXIND.EQ.0) GO TO 152
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 152
      WRITE(6,435) I
      GO TO 153
  152 WRITE(6,440) I,VEC(I)
  153 CONTINUE
  155 CONTINUE
      WRITE(6,401)
  156 CONTINUE
      IF(IPSOUT.EQ.0) GO TO 1595
      IWRT=MOD(IWRT,18)
      IF(IWRT.NE.0) GO TO 157
      WRITE(6,720)
      WRITE(6,760)NRCASE,(MISSN(J),J=1,18)
      WRITE(6,750)
```

```
      WRITE(6,790)(SYSTL1(J),J=1,16),(SYSTL2(J),J=1,16)
      WRITE(6,401)
      WRITE(6,680)
      WRITE(6,690)
      WRITE(6,402)
  157 CONTINUE
      IWRT=IWRT+1
      IPOWRR=VEC(4)
      ICOST=VEC(5)
      DO 158 J=1,3
  158 TABOUT(J)=VEC(J)
      IF(TABOUT(4).GT.1.E19) GO TO 159
      TABOUT(4)=VEC(7)
  159 CONTINUE
      DO 1590  J=5,13
      IF(TABOUT(J).GT.1.E19)GO TO 1590
      II=J+4
      TABOUT(J)=VEC(II)
      IF(J.EQ.5) TABOUT(J)=TABOUT(J)*(10.**5)
 1590 CONTINUE
      WRITE(6,700)NRCASE,KK,(JJ(J),J=1,4),(TABOUT(J),J=1,3),
     1IPOWRR,ICOST,(TABOUT(J),J=4,13)
      WRITE(6,710)(JJ(J),J=5,7)
 1595 CONTINUE
      IND=1
      WRITE(1)KK,IND,(VEC(I),I=1,17)
      IND=11
      WRITE(1)KK,IND,(JJ(J),J=1,7),(IDUM(J),J=1,10)
  160 CONTINUE
  165 CONTINUE
      WRITE(6,520)INDSYS
      IND=-1
      WRITE(1)KK,IND,(VEC(I),I=1,17)
      IF(ISYSOR.LT.NSYSOR) GO TO 130
      GO TO 5
  295 WRITE(6,475)
      STOP
  300 FORMAT(18A4)
  301 FORMAT(16A4)
  305 FORMAT(10X,'MISSION NUMBER '15/)
  310 FORMAT(7I10)
  311 FORMAT(6E10.0)
  315 FORMAT(I3,1X,I1,5X,6E10.0)
  316 FORMAT(I3,1X,I1,17A4)
  317 FORMAT(I3,1X,I1,5X,I1,3(1X,I2),10X,4A4)
  320 FORMAT(60I1,5X,I5)
  330 FORMAT(I10,10I5)
  400 FORMAT(1H1,'FOOD SYSTEM DESIGN PROGRAM'//)
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FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

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335 FORMAT(I10,20I3)
401 FORMAT(1H /)
402 FORMAT(1H )
404 FORMAT(///2X,'DEFINITION OF FUNCTIONS (BY NUMBER)'/5X,'FUNCTION NO
   1.     DESCRIPTION'/10X,'1',12X,'PROVIDE FOR FOOD'/10X,'2',12X,'STO
   2RAGE'/10X,'3',12X,'PREPARATION'/10X,'4',12X,'SERVING'/10X,'5',12X,
   3'CONSUMPTION'/10X,'6',12X,'CLEAN-UP'/10X,'7',12X,'RECORDING'//)
405 FORMAT(//1X,'THE FOLLOWING PERFORMANCE AND REQUIREMENTS CHARACTERI
   1STICS ARE TO BE EVALUATED IN THIS RUN')
410 FORMAT(8X,1A4)
412 FORMAT(8X,2A4)
414 FORMAT(8X,3A4)
415 FORMAT(8X,4A4)
417 FORMAT(///1X,'NUMBER OF PIECES OF EQUIPMENT TO BE PROCESSED ='I4/)
420 FORMAT(1X,'ICRD HAS IMPROPER VALUE = 'I4)
425 FORMAT(1H1,'EQUIPMENT CHARACTERISTICS HAVE BEEN ESTABLISHED AS FOL
   1LOWS'//5X,'NOTE - DEFINITION OF CHARACTERISTICS BY NUMBER IS'/10X,
   2'CHAR NO.     DESCR'/13X,'1',7X,'ACCEPTANCE MEAS'/13X,'2',7X,'WEIG
   3HT'/13X,'3',7X,'VOLUME'/13X,'4',7X,'POWER'/13X,'5',7X,'COST'/13X,'
   46',7X,'FAILURE RATE'/13X,'7',7X,'EQUIP OPERATING TIME'/13X,'8',7X,
   5'MAINTAINABILITY'/13X,'9',7X,'SAFETY'/12X,'10',7X,'RESUPPLY WEIGHT
   6'/12X,'11',7X,'RESUPPLY VOLUME'/12X,'12',7X,'ENERGY'/12X,'13',7X,'
   7CREW REQUIREMENTS'/12X,'14',7X,'HOT WATER REQMNTS'/12X,'15',7X,'CO
   8LD WATER REQMNTS'/12X,'16',7X,'DEVELOPMENT RISK'/)
430 FORMAT(/1X,'FOR EQUIPMENT NUMBER 'I4/2X,'ASSOCIATED FUNCTION = 'F1
   16.6/8X,'EQPT CHAR. NO.     VALUE OF CHAR.')
435 FORMAT(12X,I3,7X,'NOT CONSIDERED IN THIS RUN')
440 FORMAT(12X,I3,9X,F16.6)
441 FORMAT(1H1/1X,'NUMBER OF FUNCTIONAL SUB-SYSTEMS TO BE CONSIDERED =
   1 'I5/)
442 FORMAT(//1X,'FUNCTIONAL SUB-SYSTEM NUMBER 'I3,1X,'IS COMPRISED OF'
   1)
443 FORMAT(9X,'EQUIPMENT NUMBER 'I3)
444 FORMAT(///3X,'ERROR ENCOUNTERED IN ESTABLISHING FUNCTIONAL SUB-SYS
   1TEMS FROM EQUIPMENT LIST'/3X,'FUNCTIONS FOR FUNCTIONAL SUB-SYSTEM
   2NUMBER 'I3,1X,'ARE NOT ALL THE SAME'//)
445 FORMAT(1H1, 'FUNCTIONAL SUB-SYSTEM CHARACTERISTICS HAVE BEEN COMPU
   XTED AS FOLLOWS'
   1//5X,'NOTE - DEFINITION OF CHARACTERISTICS BY NUMBER IS'/10X,
   2'CHAR NO.     DESCR'/13X,'1',7X,'ACCEPTANCE MEAS'/13X,'2',7X,'WEIG
   3HT'/13X,'3',7X,'VOLUME'/13X,'4',7X,'POWER'/13X,'5',7X,'COST'/13X,'
   46',7X,'FAILURE RATE'/13X,'7',7X ,'RELIABILITY'/13X,'8',7X,
   5'MAINTAINABILITY'/13X,'9',7X,'SAFETY'/12X,'10',7X,'RESUPPLY WEIGHT
   6'/12X,'11',7X,'RESUPPLY VOLUME'/12X,'12',7X,'ENERGY'/12X,'13',7X,'
   7CREW REQUIREMENTS'/12X,'14',7X,'HOT WATER REQMNTS'/12X,'15',7X,'CO
   8LD WATER REQMNTS'/12X,'16',7X,'DEVELOPMENT RISK'/)
450 FORMAT(/1X,'FOR FUNCTIONAL SUB-SYSTEM NUMBRR 'I4/2X,'ASSOCIATED FU
   1NCTION = 'F16.6/6X,'SUB-SYS CHAR NO.    VALUE OF CHAR.')
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455 FORMAT(1H1,2X,'INTERFACE MATRIX IS AS FOLLOWS')
460 FORMAT(1X,'ROW NR ',I4,3X,50I2/(7X,50I2))
465 FORMAT(///2X,'FOR FUNCTION NR ',I2,2X,I2,1X,'FUNCTIONAL SUB-SYSTEMS
   1 HAVE BEEN ESTABLISHED'/)
470 FORMAT(///2X,'FOR FUNCTIONAL SUB-SYSTEM NR ',I3,2X,'ASSOCIATED FUNC
   1TION NR IS ',I4,2X,'WHICH IS NOT BETWEEN LIMITS 1 AND 7')
475 FORMAT(////3X,'RUN DELETED'//)
480 FORMAT(///1X,'BEGIN EVALUATION OF SYSTEM NR ',I4/2X,'COMPOSITION OF
   1 SYSTEM IS AS FOLLOWS'/5X,'FUNCTION NR    FUNC SUB-SYS NR'/(8X,I3,
   214X,I3))
490 FORMAT(/1X,'FOR SYSTEM NR ',I4,1X,', INTERFACE IS NOT ALLOWED BETWE
   1EN FUNCTIONAL SUB-SYSTEMS NUMBERED ',I4,1X,'AND ',I4/)
500 FORMAT(1X,'ALL FUNCTIONAL SUB-SYSTEMS INTERFACE FOR SYSTEM NR ',I4/
   1)
510 FORMAT(//1X,'CHARACTERISTICS HAVE BEEN COMPUTED FOR SYSTEM NR ',I4/
   1//5X,'NOTE - DEFINITION OF CHARACTERISTICS BY NUMBER IS'/10X,
   2'CHAR NO.      DESCR'/13X,'1',7X,'ACCEPTANCE MEAS'/13X,'2',7X,'WEIG
   3HT'/13X,'3',7X,'VOLUME'/13X,'4',7X,'POWER'/13X,'5',7X,'COST'/13X,'
   46',7X,'FAILURE RATE'/13X,'7',7X ,'RELIABILITY'/13X,'8',7X,
   5'MAINTAINABILITY'/13X,'9',7X,'SAFETY'/12X,'10',7X,'RESUPPLY WEIGHT
   6'/12X,'11',7X,'RESUPPLY VOLUME'/12X,'12',7X,'ENERGY'/12X,'13',7X,'
   7CREW REQUIREMENTS'/12X,'14',7X,'HOT WATER REQMNTS'/12X,'15',7X,'CO
   8LD WATER REQMNTS'/12X,'16',7X,'DEVELOPMENT RISK'/12X,'17',7X,'AVAI
   9LABILITY MEASURE'//5X,'COMPUTED CHARACTERISTICS ARE AS FOLLOWS'/6X
   1,'SYSTEM CHAR. NO.    VALUE OF CHAR.')
520 FORMAT(////3X,'NUMBER OF SYSTEMS FOR WHICH CHARACTERISTICS HAVE BE
   1EN COMPUTED = ',I6/)
522 FORMAT(2X,'I,IFNC,NFCNCP(IFNC),IFCNCP(IFNC,INN) '4I5)
523 FORMAT(2X,'NDPTCL(I),I=1,7   '7I5)
525 FORMAT(2X,' I = ',I5,2X,'IORDCN VECTOR IS '30I3/(31X,30I3))
530 FORMAT(2X,'KK,I1,I2,I3,I4,I5,I6,I7  '8I5)
535 FORMAT(/3X,'NUMBER OF PAIRS OF INCOMPATIBLE EQUIPMENTS = ',I3/5X,'I
   1NCOMPATIBLE EQUIPMENT PAIRS ARE AS FOLLOWS'/8X,'PAIR NO.     PAIR'
   2)
540 FORMAT(9X,I4,6X,'(',I3,',',I3,')')
545 FORMAT(//3X,'PAIRS OF INCOMPATIBLE FUNCTIONAL SUB-SYSTEMS HAVE BEE
   1N DERIVED AS FOLLOWS'/5X,'PAIR NO.     PAIR')
550 FORMAT(4X,I7,6X,'(',I4,',',I4,')')
555 FORMAT(//3X,'NUMBER OF PAIRS OF INCOMPATIBLE FUNCTIONAL SUB-SYSTEM
   1S = ',I7/)
600 FORMAT(1X,'SER    NAME/          FNC ACC WEIGHT  VOLUME  POWR   COS
   1T FAIL-RT  OP-TM  MAINT  SAFTY RES-WT RES-VOL  ENERGY CR-REQ H/W
   2 C/W  D/R')
610 FORMAT(9X,
   1'STUDY NO.',13X,'LBS    CU.FT.  WTTS   KDOL  1/HRS    HRS   1/HRS
   2 1/QHS   LBS   CU.FT.  CWH/D  MH/DAY LB/D  LB/D')
620 FORMAT(1X,I3,1X,4A4,2X,I1,2X,F3.1,1X,F6.1,1X,F8.4,1X,I5,1X,I5,1X,F
   17.6,2X,I5,2X,F6.3,1X,F5.2,1X,F6.1,1X,F8.4,1X,F6.1,1X,F5.1,2X,F4.1,
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   22X,F4.1,1X,F4.2)
  630 FORMAT(6X,I1,3('.',I2))
  640 FORMAT(1X,'SUB-SYS NO./          FNC ACC WEIGHT  VOLUME  POWR  CO
     1ST FAIL-RT REL  MAINT  SAFTY RES-WT RES-VOL  ENERGY CR-REQ   H/W
     2 C/W   D/R')
  650 FORMAT(1X,'COMPOSITION(EQP SER NOS)        LBS    CU.FT.  WTTS  KD
     1OL  1/HRS      1/HRS  1/QHS   LBS  CU.FT.   CWH/D  MH/DAY   LB/D
     2LB/D')
  660 FORMAT(1X,I4,'.',I3,16X,I1,2X,F3.1,1X,F6.1,1X,F7.1,1X,I5,1X,I5,1X,
     1F6.5,2X,F4.2,1X,F6.3,1X,F5.2,1X,F6.1,1X,F8.4,1X,F6.1,1X,F5.1,3X,F5
     2.1,1X,F5.1,1X,F4.2)
  670 FORMAT(5(5X,5(I3,',')/))
  680 FORMAT(1X,'SYS NO.    COMPOSITION        ACC WEIGHT  VOLUME  POWR
     1COST REL  SAFTY RES-WT RES-VOL  ENERGY CR-REQ   H/W    C/W   D/R  A
     2VAIL')
  690 FORMAT(11X,'(SUB-SYSTEM NOS)',8X,'LBS    CU.FT.  WTTS  KDOL      1
     1/QHS   LBS   CU.FT.  CWH/D  MH/DAY  LB/D   LB/D')
C
  700 FORMAT(1X, I4,'.',I5,1X,4(I3,','),2X,F3.1,1X,F6.1,1X,F7.1,1X,I5,1X
     1,I5,1X,F4.2,1X,F5.2,1X,F6.1,1X,F8.4,1X,F6.1,1X,F5.1,2X,F6.1,1X,F6.
     21,1X,F4.2,1X,F9.7)
  710 FORMAT(12X,2(I3,','),I3)
  720 FORMAT(1H1)
  730 FORMAT(35X,'CHARACTERISTICS OF CANDIDATE EQUIPMENTS')
  740 FORMAT(30X,'CANDIDATE FUNCTIONAL SUB-SYSTEMS - COMPOSITION AND CHA
     1RACTERISTICS')
  750 FORMAT(40X,'FOOD SYSTEMS - COMPOSITION AND CHARACTERISTICS')
  760 FORMAT(30X,'MISSION NUMBER 'I5,5X,18A4/)
  560 FORMAT(3X,'SYSTEM NO. 'I6,2X,'HAS BEEN INTERROGATED       NO. OF C
     1OMPATIBLE SYSTEMS = 'I6,2X,'TOTAL NO. OF SYSTEMS = 'I6)
  565 FORMAT(3X,'NUMBER OF COMPATIBLE SYSTEMS = 'I6)
  770 FORMAT(1H1,3X,'BEGIN SYSTEMS CONSTRUCTION FOR MINIMIZATION OF SEVE
     1RAL PERFORMANCE INDICES'/4X,'NUMBER OF DIFFERENT INDICES TO BE CON
     2SIDERED = 'I4//3X,'IN THE FOLLOWING, EACH PERFORMANCE INDEX IS OF
     3THE FORM'/7X,'W(1)*CHAR(1)+W(2)*CHAR(2)+W(3)*CHAR(3)+.........+W(17
     4)*CHAR(17)'/3X,'WHERE THE W(I) COEFFICIENTS ARE THE INPUTTED VALUE
     5S OF WEIGHTING FACTORS'/3X,'AND CHAR(I) TERMS ARE SYSTEM CHARACTER
     6ISTICS GIVEN BY'/12X,'  I          CHAR(I)'/12X,'  1        ACCEPT
     7ANCE'/12X,'  2        WEIGHT'/12X,'  3        VOLUME'/12X,'  4
     8    POWER'/12X,'  5        COST'/
     A                              12X,'  6        FAILURE RATE'/12X,
     9'  7        RELIABILITY'/12X,'  8        MAINTAINABILITY'/12X,'  9
     X        SAFETY'/12X,' 10        RESUPPLY WT'/12X,' 11        RESUP
     1PLY VOL'/12X,' 12        ENERGY'/12X,' 13        CREW REQTS'/12X,'
     2 14        HOT WATER REQTS'/12X,' 15        COLD WATER REQTS'/12X,
     3' 16        DEVELOPMENT RISK'/12X,' 17        AVAILABILITY'//)
  780 FORMAT(1H1/3X,'BEGIN SYSTEM CONSTRUCTION FOR MINIMIZATION OF PERFO
     1RMANCE INDEX NUMBER 'I4//3X,'WEIGHTING FACTORS (AS INPUTTED) ARE A
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   2S FOLLOWS'/1H0,7X,'I          W(I)'/(7X,I2,3X,F16.6))
790 FORMAT(2X,32A4)
800 FORMAT(/5X,'NOMINAL VALUE USED FOR NUMBER OF SUB-SYSTEMS PER FUNCT
   1ION IS 'I4/)
810 FORMAT(/5X,'NUMBER OF COMPATIBLE SYSTEMS DERVIVED ='I5/6X,'NUMBER
   1OF SUB-SYSTEMS PER FUNCTION CHANGED AS FOLLOWS')
850 FORMAT(1X,'IEQ = 'I3,2X,'ICRD = 'I1,2X,'DMEQ IS ',2X,17A4)
855 FORMAT(3X,'IEQCNT = 'I4)
860 FORMAT(2X,'NEQCNT = 'I4,5X,'  J   IRECEQ(J)'/(20X,I4,4X,I3))
865 FORMAT(2X,'IEQCNT = 'I4,2X,'IRECEQ(IEQCNT) = 'I4)
870 FORMAT(/3X,'NUMBER OF SUB-SYSTEMS PER FUNCTION HAS BEEN ALLOWED TO
   1ASSUME ITS'/3X,'MINIMUM VALUE AND NUMBER OF DERIVED SYSTEMS IS GRE
   2ATER THAN MAXIMUM'/10X,'PERFORMANCE INDEX EVALUATION TERMINATED'/)
    END
```

```
      FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
                    (CONTINUED)
     SUBROUTINE NOTES(ISYSPT)
200  FORMAT(1H1,2X,'NOTES ON OUTPUTTED TABLES OF CHARACTERISTICS'/)
210  FORMAT(5X,'(1) - ','TWO OR MORE ASTERISKS (***) LISTED AS THE VALU
    1E OF A CHARACTERISTIC INDICATES THAT THE CHARACTERISTIC'/11X,'HAS
    1NOT BEEN CONSIDERED IN THE RUN.'/)
220  FORMAT(5X,'(2) - ','CHARACTERISTIC HEADINGS ARE DEFINED AS FOLLOWS
    1'/13X,'ACC        - CREW ACCEPTANCE  (NON-DIMENSIONAL)'/13X,'WEIGHT
    2    - WEIGHT IN POUNDS (LBS)'/13X,'VOLUME     - VOLUME IN CUBIC FEE
    3T (CU.FT.)'/13X,'POWR       - POWER IN WATTS (WTTS)'/13X,'COST
    4 - COST IN THOUSANDS OF DOLLARS (KDOL)'/
    X                              13X,'FAIL-RT    - FAILURE RATE IN FAILURE
    5S PER HOUR (1/HRS)'/13X,'OP-TM      - EQUIPMENT OPERATING TIME IN H
    6OURS (HRS)'/13X,'MAINT      - MAINTAINABILITY IN REPAIRS PER HOUR (
    71/HRS)'/13X,'SAFTY      - SAFETY MEASURE IN ACCIDENTS PER HUNDRED T
    8HOUSAND HOURS (1/QHS)'/13X,'RES-WT     - RESUPPLY WEIGHT IN POUNDS
    9(LBS)'/13X,'RES-VOL    - RESUPPLY VOLUME IN CUBIC FEET (CU.FT.)'/13
    XX,'ENERGY     - ENERGY IN HUNDREDS OF WATT-HOURS/DAY (CWH/D)'
    X                                                    /13X,'CR-REQ     -
    1CREW REQUIREMENTS IN MAN-HOURS/DAY (MH/DAY)'/13X,'H/W         - HOT
    2WATER REQUIREMENTS IN POUNDS PER DAY (LB/D)    '/13X,'C/W         - C
    3OLD WATER REQUIREMENTS IN POUNDS PER DAY (LB/D)    '/
    A                                                   13X,'D/R         - D
    4EVELOPMENT RISK (NON-DIMENSIONAL)'/13X,'REL         - RELIABILITY ME
    5ASURE (NON-DIMENSIONAL)'/13X,'AVAIL      - AVAILABILITY MEASURE (NO
    6N-DIMENSIONAL)'/)
230  FORMAT(5X,'(3) - ','CONCERNING TABLE OF EQUIPMENT CHARACTERISTICS'
    1/13X,'(A) - THE HEADING ''SER'' IS THE EQUIPMENT''S SERIAL NUMBER
    2FOR THE RUN'/19X,'ASSIGNED IN THE COURSE OF INPUTTING TO THE RUN'/
    313X,'(B) - THE HEADING ''NAME/NO.'' REPRESENTS THE EQUIPMENT''S NA
    4ME AND (FUNCTIONAL) NUMBER.'/19X,'THESE ARE INPUTTED TO THE PROGRA
    5M TOGETHER WITH THE EQUIPMENT''S CHARACTERISTICS.'/19X,'THE FUNCTI
    6ONAL NUMBER FOR THE EQUIPMENT IS OF THE FORM  X.XX.XX.XX  AND IS L
    7ISTED UNDER THE EQUIPMENT''S NAME'/13X,'(C) - THE HEADING ''FNC''R
    8EPRESENTS THE NUMBER OF THE FUNCTION PERFORMED (IN PART) BY THE EQ
    9UIPMENT'/)
240  FORMAT(5X,'(4) - ','CONCERNING TABLE OF SUB-SYSTEM COMPOSITION AND
    1 CHARACTERISTICS'/13X,'(A) -  THE ENTRY ''SBSYS NO.'' REPRESENTS A
    2 UNIQUE NUMERICAL DESIGNATION ASSIGNED TO EACH FUNCTIONAL SUB-SYST
    3EM'/19X,'OF THE FORM ''NNNN.XXX'', WHERE NNNN IS THE CASE NUMBER (
    4AS INPUTTED) AND XXX IS A SUBSYSTEM SEQUENCE NUMBER'/19X,'ASSIGNED
    5 BY THE PROGRAM'/13X,'(B) -  THE ENTRIES LISTED UNDER ''COMPOSITIO
    6N'' REPRESENT UP TO TWENTY-FIVE EQUIPMENT SERIAL NUMBERS'/19X,'WHI
    7CH COMPRISE THE SUB-SYSTEM.  THESE ARE PRINTED BELOW THE SUBSYSTEM
    8 NUMBER IN UP TO FIVE ROWS OF'/19X,'UP TO FIVE ENTRIES EACH, SEPAR
    9ATED BY COMMAS'/13X,'(C) -  THE HEADING ''FNC'' REPRESENTS THE NUM
    XBER OF THE FUNCTION PERFORMED BY THE SUB-SYSTEM'/)
250  FORMAT(5X,'(5) - ','CONCERNING TABLE OF SYSTEM COMPOSITION AND CHA
    1RACTERISTICS'/13X,'(A) -  THE ENTRY ''SYS NO.'' REPRESENTS A UNIQU
```

```
      FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
                    (CONTINUED)
2E NUMERICAL DESIGNATION ASSIGNED TO EACH FOOD SYSTEM'/19X,'OF THE
3FORM ''NNNN.XXXXX'', WHERE NNNN IS THE CASE NUMBER (AS INPUTTED) A
4ND XXXXX IS A SYSTEM'/19X,'SEQUENCE NUMBER ASSIGNED BY THE PROGRAM
5.'/13X,'(8) -  THE ENTRIES LISTED UNDER ''COMPOSITION'' REPRESENT
6THE ASSIGNED SEQUENCE NUMBERS OF THE SUB-SYSTEMS'/19X,'WHICH COMPR
7ISE THE FOOD SYSTEM.  THERE IS ALWAYS LISTED EXACTLY SEVEN SUB-SYS
8TEM NUMBERS, ONE'/19X,'FOR EACH FUNCTION TO BE PERFORMED, AND THES
9E NUMBERS ARE SEPARATED BY COMMAS AND LISTED ON TWO LINES.'/19X,'T
XHE FIRST LISTED PERFORMS FUNCTION 1, THE SECOND LISTED PERFORMS FU
1NCTION 2, ETC.'/)
 WRITE(6,200)
 WRITE(6,210)
 WRITE(6,220)
 WRITE(6,230)
 WRITE(6,240)
 IF (ISYSPT.NE.0) WRITE(6,250)
 RETURN
 END
```

FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

```
      SUBROUTINE DPTHCL
      COMMON/DPTHIN/NFCNCP(7),FACTR(17),IPDPTH,NDPTH
      COMMON/SPACE/CNCPCH(17,300),IFCNCP(7,300),IORDCN(7,200),
     1CHRVAL(200,1),OCHRVL(200,1)
      COMMON/DPTOUT/NDPTCL(7)
      COMMON/ORDTA/KKORD(200)
      IF(IPDPTH.EQ.0) GO TO 5
      NCNCPS=0
      DO 2 I=1,7
    2 NCNCPS=NCNCPS+NFCNCP(I)
      WRITE(6,230)NCNCPS
      DO 3 I=1,NCNCPS
    3 WRITE(6,240)I,CNCPCH(6,I),CNCPCH(8,I)
    5 CONTINUE
      I=0
   10 I=I+1
      J=0
   20 J=J+1
      EMAINT=0.0
      IC=IFCNCP(I,J)
      IF(CNCPCH(8,IC).EQ.0.0) GO TO 30
      EMAINT=1./CNCPCH(8,IC)
   30 CONTINUE
      CHRVAL(J,1)=FACTR(8)*EMAINT
      DO 40 K=1,16
      IF(K.EQ.8) GO TO 40
      CHRVAL(J,1)=CHRVAL(J,1)+FACTR(K)*CNCPCH(K,IC)
   40 CONTINUE
      AVAIL=0.0
      DENOM=EMAINT+CNCPCH(6,J)
      IF(DENOM.EQ.0.0) GO TO 50
      AVAIL=EMAINT/DENOM
   50 CHRVAL(J,1)=CHRVAL(J,1)+FACTR(17)*AVAIL
      IF(IPDPTH.NE.0) WRITE(6,250)I,J,IC,EMAINT,AVAIL,CHRVAL(J,1)
      IF(J.LT.NFCNCP(I)) GO TO 20
      NMX=NFCNCP(I)
      IF(NMX.GT.1) GO TO 55
      IORDCN(I,1)=IFCNCP(I,1)
      NDPTCL(I)=1
      GO TO 100
   55 CONTINUE
      CALL ORDR(CHRVAL,OCHRVL,1,NMX,1)
      DO 60 J=1,NMX
      KK=KKORD(J)
      IORDCN(I,J)=IFCNCP(I,KK)
   60 CONTINUE
      IF(IPDPTH.EQ.0) GO TO 65
      WRITE(6,200)I,NMX
```

```
      WRITE(6,210)(KKORD(J),IORDCN(I,J),J=1,NMX)
   65 CONTINUE
      IDPTH=0
      IDPTCL=0
      J=1
   70 IDPTH=IDPTH+1
      IDPTCL=IDPTCL+1
      IF(IDPTCL.GT.NMX) GO TO 95
   80 IF(OCHRVL(J,1).NE.OCHRVL(J+1,1))GO TO 90
      IDPTCL=IDPTCL+1
      IF(IDPTCL.GT.NMX) GO TO 95
      J=J+1
      GO TO 80
   90 J=J+1
      IF(IDPTH.LT.NDPTH) GO TO 70
      NDPTCL(I)=IDPTCL
      GO TO 100
   95 CONTINUE
      NDPTCL(I)=NMX
  100 CONTINUE
      IF(IPDPTH.NE.0) WRITE(6,220)NDPTCL(I)
      IF (I.LT.7) GO TO 10
      RETURN
  200 FORMAT(3X,'SUBROUTINE DPTHCL    I = 'I2,2X,'NMX = 'I5/5X,'  KKORD(J
     1)    IORDCN(I,J)')
  210 FORMAT(10X,I5,5X,I4)
  220 FORMAT(3X,'NDPTCL(I) = 'I5)
  230 FORMAT(3X,'SUBR DPTHCL     NCNCPS = 'I5/5X,'  I      CNCPCH(6,I)
     1     CNCPCH(8,I)')
  240 FORMAT(5X,I3,2X,1E16.7,2X,1E16.7)
  250 FORMAT(5X,' I = 'I2,1X,' J = 'I3,1X,' IC = 'I4,'EMAINT = 'E16.7,1X
     1,'AVAIL = 'E16.7,1X,'CHRVAL(J,1) = 'E16.7)
      END
```

```
          FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
                      (CONTINUED)
      SUBROUTINE FSBSYS(IFIRST,NCNCPS,IPRNT)
      INTEGER*2 IDMSTR
      COMMON/SPACE/IC(7,10,10,10),IQ(7,10,10)
      COMMON/IDM/IDMSTR(300,25)
      DIMENSION N(7),M(7,10),NDUM(7),MDUM(10),IDUM(10),II(10)
C
C     IN THIS SUBROUTINE, FOR FUNCTION I (I = 1,2,3,4,5,6, AND 7),
C         N(I) = NUMBER OF SUB-FUNCTIONS IN FUNCTION I
C         M(I,J) = NUMBER OF EQUIPMENT LISTS IN SUB-FUNCTION J
C                  OF FUNCTION I
C         IQ(I,J,K) = NUMBER OF EQUIPMENTS IN EQUIPMENT LIST K
C                     OF SUB-FUNCTION J OF FUNCTION I
C         IC(I,J,K,L)= EQUIPMENT NUMBER FOR L-TH PIECE OF EQUIPMENT
C                      IN EQUIPMENT LIST K OF SUB-FUNCTION J OF FNCTN I
C
C
      REWIND 2
      IF(IFIRST.NE.0) GO TO 10
      IFIRST=1
      DO 5 I=1,7
      N(I)=1
      DO 5 J=1,10
      M(I,J)=1
      DO 5 K=1,10
      IQ(I,J,K)=0
      DO 5 L=1,10
    5 IC(I,J,K,L)=0
      GO TO 14
   10 CONTINUE
      READ (2) (N(I),I=1,7),((M(I,J),J=1,10),I=1,7)
      DO 13 I=1,7
      READ (2) ((IQ(I,J,K),K=1,10),J=1,10)
      DO 12 J=1,10
      READ (2) ((IC(I,J,K,L),L=1,10),K=1,10)
   12 CONTINUE
   13 CONTINUE
   14 READ(5,100) (NDUM(I),I=1,7)
      DO 15 I=1,7
      IF(NDUM(I).EQ.0) GO TO 15
      N(I)=NDUM(I)
   15 CONTINUE
      DO 40 I=1,7
      IF(NDUM(I).EQ.0) GO TO 40
      READ(5,110) (MDUM(J),J=1,10)
      DO 20 J=1,10
      IF(MDUM(J).EQ.0) GO TO 20
      M(I,J)=MDUM(J)
   20 CONTINUE
```

```
      DO 35 J=1,10
      IF(MDUM(J).EQ.0) GO TO 35
      MIJ=MDUM(J)
      DO 30 K=1,MIJ
      READ(5,120)IQDM,(IDUM(L),L=1,10)
      IQ(I,J,K)=IQDM
      IF(IQDM.EQ.0) GO TO 30
      DO 25 L=1,IQDM
   25 IC(I,J,K,L)=IDUM(L)
   30 CONTINUE
   35 CONTINUE
   40 CONTINUE
      WRITE(6,195)
      DO 60 I=1,7
      WRITE(6,200)I,N(I)
      NI=N(I)
      DO 55 J=1,NI
      WRITE(6,210)J,M(I,J)
      MIJ=M(I,J)
      WRITE(6,220)
      DO 50 K=1,MIJ
      IF(IQ(I,J,K).EQ.0) GO TO 45
      IQDM=IQ(I,J,K)
      WRITE(6,230)IQDM,(IC(I,J,K,L),L=1,IQDM)
      GO TO 50
   45 WRITE(6,240)IQ(I,J,K)
   50 CONTINUE
   55 CONTINUE
   60 CONTINUE
      REWIND 2
      WRITE (2) (N(I),I=1,7),((M(I,J),J=1,10),I=1,7)
      DO 63 I=1,7
      WRITE (2) ((IQ(I,J,K),K=1,10),J=1,10)
      DO 62 J=1,10
      WRITE (2) ((IC(I,J,K,L),L=1,10),K=1,10)
   62 CONTINUE
   63 CONTINUE
      DO 64 I=1,300
      DO 64 J=1,25
   64 IDMSTR(I,J)=0
      ICNCPT=0
      I=0
   65 I=I+1
      DO 68 J=1,10
   68 IF(M(I,J).EQ.0) M(I,J)=1
      MI1=M(I,1)
      MI2=M(I,2)
      MI3=M(I,3)
```

FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

```
      MI4=M(I,4)
      MI5=M(I,5)
      MI6=M(I,6)
      MI7=M(I,7)
      MI8=M(I,8)
      MI9=M(I,9)
      MI10=M(I,10)
      DO 80 I1=1,MI1
      DO 80 I2=1,MI2
      DO 80 I3=1,MI3
      DO 80 I4=1,MI4
      DO 80 I5=1,MI5
      DO 80 I6=1,MI6
      DO 80 I7=1,MI7
      DO 80 I8=1,MI8
      DO 80 I9=1,MI9
      DO 80 I10=1,MI10
      II(1)=I1
      II(2)=I2
      II(3)=I3
      II(4)=I4
      II(5)=I5
      II(6)=I6
      II(7)=I7
      II(8)=I8
      II(9)=I9
      II(10)=I10
      ICNCPT=ICNCPT+1
      K=0
      NI=N(I)
      DO 75 L=1,NI
      IL=II(L)
      IF(IQ(I,L,IL).EQ.0) GO TO 75
      IQDM=IQ(I,L,IL)
      DO 70 JJ=1,IQDM
      K=K+1
   70 IDMSTR(ICNCPT,K)=IC(I,L,IL,JJ)
   75 CONTINUE
   80 CONTINUE
      IF(I.LT.7) GO TO 65
      NCNCPS=ICNCPT
      RETURN
  100 FORMAT(7I10)
  110 FORMAT(10I5)
  120 FORMAT(I10,10I5)
  195 FORMAT(1H1/2X,'SUB-FUNCTION COMPOSITION GIVEN AS FOLLOWS'/)
  200 FORMAT(/3X,'FOR FUNCTION NUMBER 'I2,4X,'NUMBER OF SUB-FUNCTIONS =
     1'I2/)
```

```
210 FORMAT(6X,'FOR SUB-FUNCTION NO. '12,3X,'NUMBER OF EQPT LISTS = '12
    1)
220 FORMAT(8X,'NO. OF PIECES OF EQPT          EQUIPMENT LIST')
230 FORMAT(17X,I2,12X,10(I3,','))
240 FORMAT(17X,I2)
    END
```

FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

```
      SUBROUTINE ORDR(XIN,XORD,IVORD,NMX,NVAR)
C
C     REVISED 12 NOVEMBER 1970 (FOR BASIC MODEL - FOOD SYSTEM DESIGN)
C
      COMMON/ORDTA/KKORD(200)
      DIMENSION XIN(200,1),XORD(200,1),
     1XX(200),KK(200)
      II=IVORD
      DO 10 J=1,NMX
      KK(J)=J
   10 XX(J)=XIN(J,II)
      N=NMX
      ICNT=0
   20 CALL MNMUM(XX,N,K,XK)
      ICNT=ICNT+1
      KKORD(ICNT)=KK(K)
      N=N-1
      IF(K.GT.N) GO TO 40
      DO 30 J=K,N
      KK(J)=KK(J+1)
   30 XX(J)=XX(J+1)
   40 CONTINUE
      IF(N.GT.1) GO TO 20
      ICNT=ICNT+1
      KKORD(ICNT)=KK(1)
      IF(ICNT.NE.NMX) GO TO 20
      DO 50 I=1,NMX
      K=KKORD(I)
      DO 50 J=1,NVAR
      XORD(I,J)=XIN(K,J)
   50 CONTINUE
   60 CONTINUE
      RETURN
   70 WRITE(6,100)ICNT,NMX,(XIN(J,II),J=1,NMX)
      WRITE(6,110)(I,KKORD(I),I=1,ICNT)
      GO TO 60
  100 FORMAT(//2X,'IN SUBR ORDR, FINAL VALUE OF ICNT = 'I4,2X,'WHICH DOE
     1S NOT EQUAL NMX (INPUT AS 'I4,1X,')'/3X,'XIN(J,II) IS AS FOLLOWS'/
     2(8X,1E16.7))
  110 FORMAT(/3X,'    I      KKORD(I)'/(3X,I3,6X,I4))
      END
```

FOOD SYSTEM DESIGN PROGRAM - BASIC MODEL
(CONTINUED)

```
      SUBROUTINE MNMUM(X,N,K,XK)
      DIMENSION X(200)
      L=1
      LP1=2
   10 IF(X(LP1).GT.X(L)) GO TO 20
      L=LP1
   20 LP1=LP1+1
      IF(LP1.LE.N) GO TO 10
      K=L
      XK=X(L)
      RETURN
      END
```

END OF CASE

```
          FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
C
C     MAIN - FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
C
C     REVISED 16 NOVEMBER 1970
C
      INTEGER*2 JJS,KKS,ISYSOK
      COMMON/ORDTA/KKORD(2000)
      COMMON/PRTDTA/MISSN(18),NRCASE,SYSTL1(16),SYSTL2(16)
      DIMENSION IX(10),IDUM(20),VEC(17),IEQXCR(17),
     1CONSZ(18),IVCON(5),DLCON(5),NVCON(5),
     2CON(18),CODM(17),IVORD(17),
     3KKS(2000),VECS(2000,17),XX(1,2000),YY(1,2000)
      DIMENSION JJ(7),TABOUT(13),FACTR(17),JJS(7,2000),ISYSOK(2000)
      DATA IEQXCR/5*0,1,1,2,4,5,5,6,7,8,8,9,3/
      CONSZ(18)=0.0
      WRITE(6,300)
      CALL NOTES
      REWIND 1
      READ(5,250)NCASES,IP,IPV,IPO,IORDOP
      ICASE=0
    5 CONTINUE
      ICASE=ICASE+1
      WRITE(6,300)
      WRITE(6,302)
      READ(1)KK,(MISSN(I),I=1,18)
      WRITE(6,305)(MISSN(I),I=1,18)
      READ(1)KK,(IX(I),I=1,10),NRCASE,(IDUM(I),I=1,7)
      WRITE(6,306)NRCASE
      DO 1303 J=1,13
 1303 TABOUT(J)=0.0
      DO 1304 J=7,17
      IF(J.EQ.8) GO TO 1304
      IXIND=IEQXCR(J)
      IF(IXIND.EQ.0) GO TO 1304
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 1304
      II=J-4
      IF(J.EQ.7) II=II+1
      TABOUT(II)=1.E20
 1304 CONTINUE
      IF(IP.EQ.0) GO TO 7
      WRITE(6,310)(I,IX(I),I=1,9)
    7 CONTINUE
      READ(1)NSYSOR,(IDUM(I),I=1,18)
      WRITE(6,420)NSYSOR
      ISYSOR=0
    8 ISYSOR=ISYSOR+1
      READ(1)ISYTST,IDMMY,(FACTR(I),I=1,17)
```

```
        FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                    (CONTINUED)
      IF(ISYSOR.EQ.ISYTST) GO TO 9
      WRITE(6,430)ISYSOR,ISYTST
      GO TO 130
    9 CONTINUE
      IWRT=0
      WRITE(6,440)ISYSOR
      WRITE(6,450)(I,FACTR(I),I=1,17)
      READ(5,250)NTOP
      READ(5,255)(SYSTL1(J),J=1,16)
      READ(5,255)(SYSTL2(J),J=1,16)
      ICNT=0
   10 ICNT=ICNT+1
      READ(1)KK,IND,(VEC(I),I=1,17)
      IF(IP.EQ.0) GO TO 15
      WRITE(6,315)KK,IND,ICNT
      WRITE(6,320)(I,VEC(I),I=1,17)
   15 CONTINUE
      IF(IND.LT.0) GO TO 30
      READ(1)KK,IND,(JJ(J),J=1,7),(IDUM(J),J=1,10)
      KKS(ICNT)=KK
      DO 16 J=1,7
   16 JJS(J,ICNT)=JJ(J)
      II=0
      DO 20 I=1,17
      VECS(ICNT,I)=VEC(I)
   20 CONTINUE
      IF(ICNT.GE.2000) GO TO 30
      GO TO 10
   30 CONTINUE
      NSYS=ICNT-1
      WRITE(6,325)NSYS
C
C     FOR SYSTEM NUMBER  KKS(ICNT),
C               VECS(ICNT,1)  IS  ACCEPTANCE MEASURE
C               VECS(ICNT,2)  IS  WEIGHT
C               VECS(ICNT,3)  IS  VOLUME
C               VECS(ICNT,4)  IS  POWER
C               VECS(ICNT,5)  IS  COST
C     VECS(ICNT,6)  IS  FAILURE RATE
C     VECS(ICNT,7)  IS RELIABILITY
C     VECS(ICNT,8)  IS  MAINTAINABILITY
C     VECS(ICNT,9)  IS  SAFETY
C     VECS(ICNT,10) IS  RESUPPLY WEIGHT
C     VECS(ICNT,11) IS  RESUPPLY VOLUME
C     VECS(ICNT,12) IS  ENERGY
C     VECS(ICNT,13) IS  CREW REQUIREMENTS
C     VECS(ICNT,14) IS  HOT  WATER REQUIREMENTS
C     VECS(ICNT,15) IS  COLD WATER REQUIREMENTS
```

```
          FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                        (CONTINUED)
C       VECS(ICNT,16) IS  DEVELOPMENT RISK
C       VECS(ICNT,17) IS  AVAILABILITY
C
        DO 31 I=1,NSYS
        XX(1,I)=0.0
        DO 31 J=1,17
        XX(1,I)=XX(1,I)+FACTR(J)*VECS(I,J)
   31   CONTINUE
        CALL ORDR(XX,YY,1,NSYS,1)
        NTOPDM=NTOP
        IF(NTOP.GT.NSYS) NTOPDM=NSYS
        IF(NTOPDM.EQ.0) GO TO 130
        DO 34 I=1,NTOPDM
        KKO=KKORD(I)
        DO 32 J=1,17
   32   VEC(J)=VECS(KKO,J)
        KK=KKS(KKO)
        DO 33 J=1,7
   33   JJ(J)=JJS(J,KKO)
        CALL PRINT(IWRT,KK,VEC,JJ,TABOUT)
   34   CONTINUE
        READ(5,260)(CONSZ(I),I=1,17)
C
C       CONSZ(I) IS THE BASE CONSTRAINT VALUE FOR CHARACTERISTIC NUMBER I
C
        READ(5,250)NVARCN
C
C       NVARCN IS THE NUMBER OF CONSTRAINT PARAMETERS TO VARY (NVARCN.LE.5
C
        DO 35 I=1,5
        IVCON(I)=18
        DLCON(I)=0.0
        NVCON(I)=1
   35   CONTINUE
        IF(NVARCN.EQ.0) GO TO 45
        DO 40 I=1,NVARCN
   40   READ(5,270)IVCON(I),DLCON(I),NVCON(I)
   45   CONTINUE
        DO 50 I=1,17
   50   CON(I)=CONSZ(I)
        NVC1=NVCON(1)
        NVC2=NVCON(2)
        NVC3=NVCON(3)
        NVC4=NVCON(4)
        NVC5=NVCON(5)
        III=IVCON(1)
        II2=IVCON(2)
        II3=IVCON(3)
```

FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
(CONTINUED)

```
      II4=IVCON(4)
      II5=IVCON(5)
      ICNT=0
      CON(II1)=CONSZ(II1)-DLCON(1)
      DO 90 I1=1,NVC1
      CON(II1)=CON(II1)+DLCON(1)
      CON(II2)=CONSZ(II2)-DLCON(2)
      DO 90 I2=1,NVC2
      CON(II2)=CON(II2)+DLCON(2)
      CON(II3)=CONSZ(II3)-DLCON(3)
      DO 90 I3=1,NVC3
      CON(II3)=CON(II3)+DLCON(3)
      CON(II4)=CONSZ(II4)-DLCON(4)
      DO 90 I4=1,NVC4
      CON(II4)=CON(II4)+DLCON(4)
      CON(II5)=CONSZ(II5)-DLCON(5)
      DO 90 I5=1,NVC5
      CON(II5)=CON(II5)+DLCON(5)
      ICNT=ICNT+1
      IF(IP.NE.0) WRITE(6,330)ICNT
      IF(IP.EQ.0) GO TO 56
      DO 55 I=1,17
      IXIND=IEQXCR(I)
      IF(IXIND.EQ.0) GO TO 52
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 52
      WRITE(6,332)I
      GO TO 55
   52 WRITE(6,335)I,CON(I)
   55 CONTINUE
      WRITE(6,390)
   56 CONTINUE
      DO 58 I=2,16
   58 CODM(I)=CON(I)
      CODM(1)=-CON(1)
      CODM(7)=-CON(7)
      CODM(17)=-CON (17)
      ISYS=0
      IOK=0
   60 ISYS=ISYS+1
      KK=KKS(ISYS)
      DO 65 I=2,16
   65 VEC(I)=VECS(ISYS,I)
      VEC(1)=-VECS(ISYS,1)
      VEC(7)=-VECS(ISYS,7)
      VEC(17)=-VECS(ISYS,17)
      DO 70 I=1,17
      IXIND=IEQXCR(I)
```

```
      IF(IXIND.EQ.0) GO TO 68
      IXX=IX(IXIND)
      IF(IXX.NE.0) GO TO 70
   68 CONTINUE
      IF(VEC(I).GT.CODM(I)) GO TO 75
   70 CONTINUE
      IF(IP.NE.0)WRITE(6,340)KK
      IOK=IOK+1
      ISYSOK(IOK)=ISYS
      DO 73 I=1,15
      IXIND=IEQXCR(I)
      IF(IXIND.EQ.0) GO TO 72
      IXX=IX(IXIND)
      IF(IXX.EQ.0) GO TO 72
      IF(IP.NE.0)WRITE(6,332)I
      GO TO 73
   72 CONTINUE
      IF(IP.EQ.0) GO TO 73
      WRITE(6,345)I,VECS(ISYS,I)
   73 CONTINUE
      GO TO 80
   75 CONTINUE
      IF(IP.NE.0) WRITE(6,350) KK
   80 CONTINUE
      IF(ISYS.LT.NSYS) GO TO 60
      IWRT=0
      NOK=IOK
      IF (NOK.EQ.0) GO TO 85
      IF(NOK.GT.1) GO TO 8000
      NTOPDM=1
      KKORD(1)=1
      GO TO 8100
 8000 CONTINUE
      DO 81 IOK=1,NOK
      ISYS=ISYSOK(IOK)
      XX(1,IOK)=0.0
      DO 81 J=1,17
      XX(1,IOK)=XX(1,IOK)+FACTR(J)*VECS(ISYS,J)
   81 CONTINUE
      CALL ORDR(XX,YY,1,NOK,1)
      NTOPDM=NTOP
      IF(NTOP.GT.NOK) NTOPDM=NOK
 8100 CONTINUE
      READ(5,255)(SYSTL1(J),J=1,16)
      READ(5,255)(SYSTL2(J),J=1,16)
      DO 84 I=1,NTOPDM
      IOK=KKORD(I)
      ISYS=ISYSOK(IOK)
```

```
      DO 82 J=1,17
   82 VEC(J)=VECS(ISYS,J)
      KK=KKS(ISYS)
      DO 83 J=1,7
   83 JJ(J)=JJS(J,ISYS)
      CALL PRINT(IWRT,KK,VEC,JJ,TABOUT)
   84 CONTINUE
      GO TO 90
   85 CONTINUE
      READ(5,255)(SYSTL1(J),J=1,16)
      READ(5,255)(SYSTL2(J),J=1,16)
      DO 86 J=1,17
   86 VEC(J)=0.0
      KK=0
      DO 87 J=1,7
   87 JJ(J)=0
      CALL PRINT(IWRT,KK,VEC,JJ,TABOUT)
      WRITE(6,460)NOK
   90 CONTINUE
      WRITE(6,355)
C
C     BEGIN ORDERING TASK
C
      IF(IORDOP.EQ.0) GO TO 120
      READ(5,250)NVORD
      WRITE(6,360)NVORD
      IF(NVORD.EQ.0) GO TO 120
      READ(5,280)(IVORD(I),I=1,NVORD)
      DO 110 II=1,NVORD
      IV=IVORD(II)
      WRITE(6,370)II,IV
      DO 95 I=1,NSYS
   95 XX(1,I)=VECS(I,IV)
      CALL ORDR(XX,YY,1,NSYS,1)
      IF(IPO.EQ.0) GO TO 100
      WRITE(6,375)(YY(1,I),I=1,NSYS)
  100 CONTINUE
      WRITE(6,378)
      DO 105 I=1,NSYS
      KKO=KKORD(I)
      K=KKS(KKO)
      WRITE(6,380)I,K
  105 CONTINUE
      WRITE(6,390)
  110 CONTINUE
  120 CONTINUE
      IF(ISYSOR.LT.NSYSOR) GO TO 8
      WRITE(6,400)
```


5

```
      FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                    (CONTINUED)
    IF(ICASE.LT.NCASES) GO TO 5
130 CONTINUE
    WRITE(6,410)
    STOP
250 FORMAT(7I10)
255 FORMAT(16A4)
260 FORMAT(6E10.0)
270 FORMAT(I10,1E10.0,I10)
280 FORMAT(14I5)
300 FORMAT(1H1/3X,'PROGRAM TO EVALUATE FOOD SYSTEM DESIGNS'//)
302 FORMAT(//2X,'IN THIS PROGRAM, NUMBERING OF CHARACTERISTICS (AND CO
   INSTRAINT PARAMETERS DEFINED BY'/5X,' NUMBER    CHARACTERISTIC'/
   25X,'    1',6X,'ACCEPTANCE'/
   35X,'    2',6X,'WEIGHT'/
   45X,'    3',6X,'VOLUME'/
   55X,'    4',6X,'POWER'/
   65X,'    5',6X,'COST'/
   75X,'    6',6X,'FAILURE RATE'/
   85X,'    7',6X,'RELIABILITY'/
   95X,'    8',6X,'MAINTAINABILITY'/
   X5X,'    9',6X,'SAFETY'/
   15X,'   10',6X,'RESUPPLY WEIGHT'/
   25X,'   11',6X,'RESUPPLY VOLUME'/
   35X,'   12',6X,'ENERGY'/
   45X,'   13',6X,'CREW REQUIREMENTS'/
   55X,'   14',6X,'HOT WATER REQUIREMENTS'/
   65X,'   15',6X,'COLD WATER REQUIREMENTS'/
   75X,'   16',6X,'DEVELOPMENT RISK'/
   85X,'   17',6X,'AVAILABILITY'///)
305 FORMAT(18A4)
306 FORMAT(//8X,'MISSION NUMBER 'I5/)
310 FORMAT(/1X,'IX VECTOR IS'/5X,' I    IX(I)'/(5X,I2,3X,I3))
315 FORMAT(2X,'KK,IND,ICNT',3X,3I4)
320 FORMAT(3X,' I    VEC(I)'/(3X,I2,2X,E16.7))
325 FORMAT(/2X,'NUMBER OF SYSTEMS TO BE EVALUATED = 'I4/)
330 FORMAT(1H1/3X,'BEGIN EVALUATION USING CONSTRAINT SET NUMBER 'I4/
   14X,'FOR WHICH CONSTRAINT VALUES ARE'/5X,'VARIABLE NR.    CONSTRAIN
   2T VALUE')
332 FORMAT(9X,I2,7X,'NOT CONSIDERED IN THIS RUN')
335 FORMAT(9X,I2,7X,F16.6)
340 FORMAT(3X,'SYSTEM NUMBER 'I4,2X,'SATISFIES ALL CONSTRAINTS'/4X,'SY
   1STEM CHARACTERISTICS ARE AS FOLLOWS'/5X,'VARIABLE NR.    CHARACT.
   2VALUE')
345 FORMAT(9X,I2,7X,F16.6)
350 FORMAT(3X,'SYSTEM NUMBER 'I4,2X,'DOES NOT SATISFY ALL CONSTRAINTS'
   1)
355 FORMAT(///2X,'END OF CONSTRAINT EVALUATIONS')
360 FORMAT(1H1/2X,'BEGIN ORDERING TASK'/3X,'NUMBER OF DIFFERENT ORDERI
```

```
      FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                    (CONTINUED)
     1NGS TO BE DERIVED = '14/)
  370 FORMAT(//3X,'ORDERING NUMBER '14/4X,'NUMBER OF CHARACTERISTIC BY W
     1HICH ORDER IS TO BE ESTABLISHED = '12)
  375 FORMAT(2X,' YY VECTOR '/(8E16.7))
  378 FORMAT(4X,'ORDERING IS AS FOLLOWS'/5X,'NR IN ORDER      SYSTEM NR'
     1)
  380 FORMAT(7X,15,5X,15)
  390 FORMAT(/)
  400 FORMAT(//3X,'END OF CASE')
  410 FORMAT(////3X,'END OF RUN')
  420 FORMAT(//3X,'NUMBER OF PERFORMANCE INDICES TO BE CONSIDERED FOR TH
     1IS MISSION = '14/)
  430 FORMAT(//5X,'ISYSOR (SET IN EVAL LINK) DOES NOT EQUAL ISYTST (INPU
     1T FROM TAPE GENERATED BY BASIC MODEL'/10X,'ISYSOR = '15,5X,'ISYTST
     2 = '15/)
  440 FORMAT(1H1,3X,'BEGIN ANALYSIS FOR PERFORMANCE INDEX NUMBER '14/7X,
     1'WEIGHTING FACTORS ARE AS FOLLOWS'/9X,'  I        W(I)')
  450 FORMAT(9X,13,2X,F16.6)
  460 FORMAT(//20X,'NUMBER OF SYSTEMS MEETING CONSTRAINTS = '12/)
      END
```

```
      FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                  (CONTINUED)
      SUBROUTINE NOTES
  200 FORMAT('1H1,2X,'NOTES ON OUTPUTTED TABLES OF CHARACTERISTICS'/)
  210 FORMAT(5X,'(1) - ','TWO OR MORE ASTERISKS (***) LISTED AS THE VALU
     1E OF A CHARACTERISTIC INDICATES THAT THE CHARACTERISTIC'/11X,'HAS
     1NOT BEEN CONSIDERED IN THE RUN.'/)
  220 FORMAT(5X,'(2) - ','CHARACTERISTIC HEADINGS ARE DEFINED AS FOLLOWS
     1'/13X,'ACC        - CREW ACCEPTANCE  (NON-DIMENSIONAL)'/13X,'WEIGHT
     2    - WEIGHT IN POUNDS (LBS)'/13X,'VOLUME     - VOLUME IN CUBIC FEE
     3T (CU.FT.)'/13X,'POWR       - POWER IN WATTS (WTTS)'/13X,'COST
     4 - COST IN THOUSANDS OF DOLLARS (KDOL)'/
     7         13X,'SAFTY      - SAFETY MEASURE IN ACCIDENTS PER HUNDRED T
     8HOUSAND HOURS (1/QHS)'/13X,'RES-WT     - RESUPPLY WEIGHT IN POUNDS
     9(LBS)'/13X,'RES-VOL    - RESUPPLY VOLUME IN CUBIC FEET (CU.FT.)'/13
     XX,'ENERGY     - ENERGY IN HUNDREDS OF WATT-HOURS/DAY (CWH/D)'
     X                                                    /13X,'CR-REQ     -
     1CREW REQUIREMENTS IN MAN-HOURS/DAY (MH/DAY)'/13X,'H/W        - HOT
     2WATER REQUIREMENTS IN POUNDS PER DAY (LB/D)    '/13X,'C/W        - C
     30LD WATER REQUIREMENTS IN POUNDS PER DAY (LB/D)    '/
     A                                                    13X,'D/R        - D
     4EVELOPMENT RISK (NON-DIMENSIONAL)'/13X,'REL        - RELIABILITY ME
     5ASURE (NON-DIMENSIONAL)'/13X,'AVAIL      - AVAILABILITY MEASURE (NO
     6N-DIMENSIONAL)'/)
  250 FORMAT(5X,'(3) - ','CONCERNING TABLE OF SYSTEM COMPOSITION AND CHA
     1RACTERISTICS'/13X,'(A) -  THE ENTRY ''SYS NO.'' REPRESENTS A UNIQU
     2E NUMERICAL DESIGNATION ASSIGNED TO EACH FOOD SYSTEM'/19X,'OF THE
     3FORM ''NNNN.XXXXX'', WHERE NNNN IS THE CASE NUMBER (AS INPUTTED) A
     4ND XXXXX IS A SYSTEM'/19X,'SEQUENCE NUMBER ASSIGNED BY THE PROGRAM
     5.'/13X,'(B) -  THE ENTRIES LISTED UNDER ''COMPOSITION'' REPRESENT
     6THE ASSIGNED SEQUENCE NUMBERS OF THE SUB-SYSTEMS'/19X,'WHICH COMPR
     7ISE THE FOOD SYSTEM.  THERE IS ALWAYS LISTED EXACTLY SEVEN SUB-SYS
     8TEM NUMBERS, ONE'/19X,'FOR EACH FUNCTION TO BE PERFORMED, AND THES
     9E NUMBERS ARE SEPARATED BY COMMAS AND LISTED ON TWO LINES.'/19X,'T
     XHE FIRST LISTED PERFORMS FUNCTION 1, THE SECOND LISTED PERFORMS FU
     1NCTION 2, ETC.'/)
      WRITE(6,200)
      WRITE(6,210)
      WRITE(6,220)
      WRITE(6,250)
      RETURN
      END
```

```
        FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                    (CONTINUED)
      SUBROUTINE PRINT(IWRT,KK,VEC,JJ,TABOUT)
      COMMON/PRTDTA/MISSN(18),NRCASE,SYSTL1(16),SYSTL2(16)
      DIMENSION VEC(17),JJ(7),TABOUT(13)
      IWRT=MOD(IWRT,18)
      IF(IWRT.NE.0) GO TO 157
      WRITE(6,720)
      WRITE(6,760)NRCASE,(MISSN(J),J=1,18)
      WRITE(6,750)
      WRITE(6,790)(SYSTL1(I),I=1,16),(SYSTL2(I),I=1,16)
      WRITE(6,401)
      WRITE(6,680)
      WRITE(6,690)
      WRITE(6,402)
  157 CONTINUE
      IWRT=IWRT+1
      IPOWRR=VEC(4)
      ICOST=VEC(5)
      DO 158 J=1,3
  158 TABOUT(J)=VEC(J)
      IF(TABOUT(4).GT.1.E19) GO TO 159
      TABOUT(4)=VEC(7)
  159 CONTINUE
      DO 1590  J=5,13
      IF(TABOUT(J).GT.1.E19)GO TO 1590
      II=J+4
      TABOUT(J)=VEC(II)
      IF(J.EQ.5) TABOUT(J)=TABOUT(J)*(10.**5)
 1590 CONTINUE
      WRITE(6,700)NRCASE,KK,(JJ(J),J=1,4),(TABOUT(J),J=1,3),
     1IPOWRR,ICOST,(TABOUT(J),J=4,13)
      WRITE(6,710)(JJ(J),J=5,7)
      RETURN
  401 FORMAT(1H /)
  402 FORMAT(1H )
  680 FORMAT(1X,'SYS NO.    COMPOSITION        ACC WEIGHT  VOLUME  POWR
     1COST REL  SAFTY RES-WT RES-VOL  ENERGY CR-REQ   H/W     C/W  D/R  A
     2VAIL')
  690 FORMAT(11X,'(SUB-SYSTEM NOS)',8X,'LBS    CU.FT.  WTTS  KDOL       1
     1/QHS   LBS   CU.FT.  CWH/D  MH/DAY  LB/D   LB/D')
C
  700 FORMAT(1X, I4,'.',I5,1X,4(I3,','),2X,F3.1,1X,F6.1,1X,F7.1,1X,I5,1X
     1,I5,1X,F4.2,1X,F5.2,1X,F6.1,1X,F8.4,1X,F6.1,1X,F5.1,2X,F6.1,1X,F6.
     21,1X,F4.2,1X,F9.7)
  710 FORMAT(12X,2(I3,','),I3)
  720 FORMAT(1H1)
  750 FORMAT(40X,'FOOD SYSTEMS - COMPOSITION AND CHARACTERISTICS')
  760 FORMAT(30X,'MISSION NUMBER 'I5,5X,18A4/)
  790 FORMAT(2X,32A4)

      END
```

```
      FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
                    (CONTINUED)
      SUBROUTINE ORDR(XIN,XORD,IVORD,NMX,NVAR)
      COMMON/ORDTA/KKORD(2000)
      DIMENSION XIN(1,2000),XORD(1,2000),
     1XX(2000),KK(2000),XXORD(2000)
      II=IVORD
      DO 10 J=1,NMX
      KK(J)=J
   10 XX(J)=XIN(II,J)
      N=NMX
      ICNT=0
   20 CALL MNMUM(XX,N,K,XK)
      ICNT=ICNT+1
      KKORD(ICNT)=KK(K)
      XXORD(ICNT)=XK
      N=N-1
      IF(K.GT.N) GO TO 40
      DO 30 J=K,N
      KK(J)=KK(J+1)
   30 XX(J)=XX(J+1)
   40 CONTINUE
      IF(N.GT.1) GO TO 20
      ICNT=ICNT+1
      KKORD(ICNT)=KK(1)
      XXORD(ICNT)=XX(1)
      IF(ICNT.NE.NMX) GO TO 20
      DO 50 I=1,NMX
      K=KKORD(I)
      DO 50 J=1,NVAR
      XORD(J,I)=XIN(J,K)
   50 CONTINUE
   60 CONTINUE
      RETURN
   70 WRITE(6,100)ICNT,NMX,(XIN(II,J),J=1,NMX)
      WRITE(6,110)(I,KKORD(I),XXORD(I),I=1,ICNT)
      GO TO 60
  100 FORMAT(//2X,'IN SUBR ORDR, FINAL VALUE OF ICNT = '14,2X,'WHICH DOE
     1S NOT EQUAL NMX (INPUT AS '14,1X,')'/3X,'XIN(II,J) IS AS FOLLOWS'/
     2(8X,1E16.7))
  110 FORMAT(/3X,'    I      KKORD(I)      XXORD(I)'/(3X,I3,5X,I4,6X,1E16.7
     1))
      END
```

FOOD SYSTEM DESIGN PROGRAM - EVALUATION LINK
(CONTINUED)

```
      SUBROUTINE MNMUM(X,N,K,XK)
      DIMENSION X(2000)
      L=1
      LP1=2
   10 IF(X(LP1).GT.X(L)) GO TO 20
      L=LP1
   20 LP1=LP1+1
      IF(LP1.LE.N) GO TO 10
      K=L
      XK=X(L)
      RETURN
      END
```

END OF CASE

```
          FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
C
C     MAIN - FOOD SYSTEM DESIGN - PLOTTING LINK
C
      INTEGER*2 KKS,JJS
      COMMON/ORDTA/KKORD(2000)
      COMMON/AUDATA/IOPAUX,AUXTTL(9)
      DIMENSION MISSN(18),IX(10),IDUM(20),VEC(17),
     1KKS(2000),VECS(2000,15),
     2ABSCA(2000,1),ORD(2000,1),N(1),
     3TTLDUM(5),XTITLE(18),YTITLE(18),IBUF(1000)
      DIMENSION TTLS01(5),TTLS02(5),TTLS03(5),TTLS04(5),TTLS05(5),
     1          TTLS06(5),TTLS07(5),TTLS08(5),TTLS09(5),TTLS10(5),
     2          TTLS11(5),TTLS12(5),TTLS13(5),TTLS14(5),TTLS15(5)
      DIMENSION JJ(7),JJS(7,2000),FACTR(17)
      DATA TTLS01/'  CREW ACCEPTANCE    '/
      DATA TTLS02/'       WEIGHT        '/
      DATA TTLS03/'       VOLUME        '/
      DATA TTLS04/'       POWER         '/
      DATA TTLS05/'        COST         '/
      DATA TTLS06/'   RELIABILITY       '/
      DATA TTLS07/'      SAFETY         '/
      DATA TTLS08/' RESUPPLY WEIGHT     '/
      DATA TTLS09/' RESUPPLY VOLUME     '/
      DATA TTLS10/'       ENERGY        '/
      DATA TTLS11/' CREW REQUIREMENTS   '/
      DATA TTLS12/' HOT WATER REQTS     '/
      DATA TTLS13/' COLD WATER REQTS    '/
      DATA TTLS14/' DEVELOPMENT RISK    '/
      DATA TTLS15/'   AVAILABILITY      '/
      DATA XTITLE/72H
     1                          /
      DATA YTITLE/72H
     1                          /
      REWIND 1
      CALL PLOTS(IBUF,1000,LDEV)
      NORD=1
      IOPPLT=1
      IOPAUX=1
      READ(5,250)NCASES,IP,IPP,IPPLOT
      ICASE=0
    5 CONTINUE
      ICASE=ICASE+1
      WRITE(6,300)
      WRITE(6,302)
      READ(1)KK,(MISSN(I),I=1,18)
      WRITE(6,305)(MISSN(I),I=1,18)
      READ(1)KK,(IX(I),I=1,10),NRCASE,(IDUM(I),I=1,7)
      WRITE(6,306)NRCASE
```

```
      FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
                    (CONTINUED)
      IF(IP.EQ.0) GO TO 7
      WRITE(6,310)(I,IX(I),I=1,9)
    7 CONTINUE
      READ(1) NSYSOR,(IDUM(I),I=1,18)
      WRITE(6,420)NSYSOR
      ISYSOR=0
    8 ISYSOR=ISYSOR+1
      READ(1) ISYTST,IDMMY,(FACTR(J),J=1,17)
      IF(ISYSOR.EQ.ISYTST) GO TO 9
      WRITE(6,430)ISYSOR,ISYTST
      GO TO 120
    9 CONTINUE
      WRITE(6,440)ISYSOR
      WRITE(6,450)(I,FACTR(I),I=1,17)
      WRITE(6,460)
      READ(5,255)(AUXTTL(I),I=1,9)
      ICNT=0
   10 ICNT=ICNT+1
      READ(1)KK,IND,(VEC(I),I=1,17)
      IF(IP.EQ.0) GO TO 15
      WRITE(6,315)KK,IND,ICNT
      WRITE(6,320)(I,VEC(I),I=1,17)
   15 CONTINUE
      IF(IND.LT.0) GO TO 30
      READ(1)KK,IND,(JJ(J),J=1,7),(IDUM(J),J=1,10)
      KKS(ICNT)=KK
      DO 16 J=1,7
   16 JJS(J,ICNT)=JJ(J)
      II=0
      DO 20 I=1,17
      IF(I.EQ.6.OR.I.EQ.8) GO TO 20
      II=II+1
      VECS(ICNT,II)=VEC(I)
   20 CONTINUE
      IF(ICNT.GE.2000) GO TO 30
      GO TO 10
   30 CONTINUE
      NSYS=ICNT-1
      WRITE(6,325)NSYS
C
C     FOR SYSTEM NUMBER  KKS(ICNT),
C               VECS(ICNT,1)  IS  ACCEPTANCE MEASURE
C               VECS(ICNT,2)  IS  WEIGHT
C               VECS(ICNT,3)  IS  VOLUME
C               VECS(ICNT,4)  IS  POWER
C               VECS(ICNT,5)  IS  COST
C               VECS(ICNT,6)  IS  RELIABILITY
C               VECS(ICNT,7)  IS  SAFETY
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      SUBROUTINE ORDR(XIN,XORD,IVORD,NMX,NVAR)
C
C     REVISED 19 OCTOBER 1970 (FOR PLOT LINK - FOOD SYSTEM DESIGN)
C
      COMMON/ORDTA/KKORD(2000)
      DIMENSION XIN(2000,1),XORD(2000,1),
     1XX(2000),KK(2000)
      II=IVORD
      DO 10 J=1,NMX
      KK(J)=J
   10 XX(J)=XIN(J,II)
      N=NMX
      ICNT=0
   20 CALL MNMUM(XX,N,K,XK)
      ICNT=ICNT+1
      KKORD(ICNT)=KK(K)
      N=N-1
      IF(K.GT.N) GO TO 40
      DO 30 J=K,N
      KK(J)=KK(J+1)
   30 XX(J)=XX(J+1)
   40 CONTINUE
      IF(N.GT.1) GO TO 20
      ICNT=ICNT+1
      KKORD(ICNT)=KK(1)
      IF(ICNT.NE.NMX) GO TO 20
      DO 50 I=1,NMX
      K=KKORD(I)
      DO 50 J=1,NVAR
      XORD(I,J)=XIN(K,J)
   50 CONTINUE
   60 CONTINUE
      RETURN
   70 WRITE(6,100)ICNT,NMX,(XIN(J,II),J=1,NMX)
      WRITE(6,110)(I,KKORD(I),I=1,ICNT)
      GO TO 60
  100 FORMAT(//2X,'IN SUBR ORDR, FINAL VALUE OF ICNT = 'I4,2X,'WHICH DOE
     1S NOT EQUAL NMX (INPUT AS 'I4,1X,')'/3X,'XIN(J,II) IS AS FOLLOWS'/
     2(8X,1E16.7))
  110 FORMAT(/3X,'    I      KKORD(I)'/(3X,I3,6X,I4))
      END
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      SUBROUTINE MNMUM(X,N,K,XK)
      DIMENSION X(2000)
      L=1
      LP1=2
   10 IF(X(LP1).GT.X(L)) GO TO 20
      L=LP1
   20 LP1=LP1+1
      IF(LP1.LE.N) GO TO 10
      K=L
      XK=X(L)
      RETURN
      END
```

```
        FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
                    (CONTINUED)
100  CONTINUE
     IF(ISYSOR.LT.NSYSOR) GO TO 8
     WRITE(6,400)
     IF(ICASE.LT.NCASES) GO TO 5
120  CONTINUE
     CALL PLOT(15.0,0.0,999)
     WRITE(6,410)
     STOP
250  FORMAT(7I10)
255  FORMAT(9A4)
300  FORMAT(1H1/3X,'PROGRAM TO PLOT CHARACTERISTICS OF FOOD SYSTEMS'//)
302  FORMAT(//2X,'IN THIS PROGRAM, NUMBERING OF CHARACTERISTICS DEFINED
    1 BY'/5X,' NUMBER     CHARACTERISTIC'/
    25X,'    1',6X,'ACCEPTANCE'/
    35X,'    2',6X,'WEIGHT'/
    45X,'    3',6X,'VOLUME'/
    55X,'    4',6X,'POWER'/
    65X,'    5',6X,'COST'/
    75X,'    6',6X,'RELIABILITY'/
    85X,'    7',6X,'SAFETY'/
    95X,'    8',6X,'RESUPPLY WEIGHT'/
    X5X,'    9',6X,'RESUPPLY VOLUME'/
    15X,'   10',6X,'ENERGY'/
    25X,'   11',6X,'CREW REQUIREMENTS'/
    35X,'   12',6X,'HOT WATER REQUIREMENTS'/
    45X,'   13',6X,'COLD WATER REQUIREMENTS'/
    55X,'   14',6X,'DEVELOPMENT RISK'/
    65X,'   15',6X,'AVAILABILITY'///)
305  FORMAT(18A4)
306  FORMAT(//8X,'MISSION NUMBER 'I5/)
310  FORMAT(/1X,'IX VECTOR IS'/5X,' I    IX(I)'/(5X,I2,3X,I3))
315  FORMAT(2X,'KK,IND,ICNT',3X,3I4)
320  FORMAT(3X,' I    VEC(I)'/(3X,I2,2X,E16.7))
325  FORMAT(/2X,'NUMBER OF SYSTEMS ='I5/)
328  FORMAT(//3X,'NUMBER OF PLOTS FOR THIS PERFORMANCE INDEX = 'I4/)
330  FORMAT(//4X,'PLOT NUMBER 'I3/7X,'ABSCA IS CHARACTERISTIC NUMBERED
    1'I3/7X,'ORDINATE IS CHARACTERISTIC NUMBERED 'I4//)
331  FORMAT(7X,'PLOT TITLE IS     ',18A4)
332  FORMAT(24X,'MISSION NUMBER 'I5)
333  FORMAT(9X,'ABSCISSA TITLE IS    ',18A4)
334  FORMAT(9X,'ORDINATE TITLE IS    ',18A4)
335  FORMAT(/5X,'DEFINITION OF PLOT POINTS BY SYSTEM'/7X,' POINT NR
    1    ABSCISSA VALUE       SYSTEM NR          COMPOSITION')
340  FORMAT(9X,I4,10X,F16.6,3X,I6,'.',I6,2X,6(I3,','),I3)
345  FORMAT(/7X,'DATA TO BE PLOTTED IS'/9X,'    I        ABSCA(I)
    1ORD(I)')
350  FORMAT(10X,I3,4X,F16.6,2X,F16.6)
390  FORMAT(/)
```

```
        FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
                    (CONTINUED)
400 FORMAT(//3X,'END OF CASE')
410 FORMAT(////3X,'END OF RUN')
420 FORMAT(//3X,'NUMBER OF PERFORMANCE INDICES TO BE CONSIDERED FOR TH
   1IS MISSION = 'I4/)
430 FORMAT(//5X,'ISYSOR (SET IN PLOT LINK) DOES NOT EQUAL ISYTST (FROM
   1 TAPE GENERATED BY BASIC MDL'/10X,'ISYSOR = 'I5,5X,'ISYTST = 'I5/)
440 FORMAT(1H1,3X,'BEGIN PLOTS FOR PERFORMANCE INDEX NUMBER 'I4/7X,'WE
   1IGHTING FACTORS ARE AS FOLLOWS'/9X,'  I        W(I)')
450 FORMAT(9X,I3,2X,F16.6)
460 FORMAT(3X,'NOTE - THE WEIGHTING FACTORS, W(I), ARE COEFFICIENTS MU
   1LTIPLYING CHARACTERISTICS AS DEFINED BY'/5X,'  I       CHARACTERIST
   2IC FOR WHICH W(I) IS COEFF'/7X,'1           ACCEPTANCE'/7X,'2
   3    WEIGHT'/7X,'3           VOLUME'/7X,'4           POWER'/7X,'5
   4      COST'/7X,'6           FAILURE RATE'/7X,'7          RELIABILIT
   5Y'/7X,'8          MAINTAINABILITY'/7X,'9          SAFETY'/6X,'10
   6         RESUPPLY WEIGHT'/6X,'11          RESUPPLY VOLUME'/6X,'12
   7         ENERGY'/6X,'13          CREW REQUIREMENTS'/6X,'14
   8 HOT WATER REQUIREMENTS'/6X,'15          COLD WATER REQUIREMENTS'/
   96X,'16          DEVELOPMENT RISK'/6X,'17          AVAILABILITY'/)
    END
```

```
          FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
                      (CONTINUED)
C               VECS(ICNT,8)  IS  RESUPPLY WEIGHT
C               VECS(ICNT,9)  IS  RESUPPLY VOLUME
C               VECS(ICNT,10) IS  ENERGY
C               VECS(ICNT,11) IS  CREW REQUIREMENTS
C               VECS(ICNT,12) IS  HOT  WATER REQUIREMENTS
C               VECS(ICNT,13) IS  COLD WATER REQUIREMENTS
C               VECS(ICNT,14) IS  DEVELOPMENT RISK
C               VECS(ICNT,15) IS  AVAILABILITY
C
      N(1)=NSYS
      READ(5,250)NPLOTS
      WRITE(6,328)NPLOTS
      DO 100 IPL=1,NPLOTS
      READ(5,250)IABSC,IORD
      WRITE(6,330)IPL,IABSC,IORD
      III=IABSC
   31 CONTINUE
      GO TO (3001,3003,3005,3007,3009,3011,3013,3015,3017,3019,3021,
     13023,3025,3027,3029),III
 3001 DO 3002 I=1,5
 3002 TTLDUM(I)=TTLS01(I)
      GO TO 32
 3003 DO 3004 I=1,5
 3004 TTLDUM(I)=TTLS02(I)
      GO TO 32
 3005 DO 3006 I=1,5
 3006 TTLDUM(I)=TTLS03(I)
      GO TO 32
 3007 DO 3008 I=1,5
 3008 TTLDUM(I)=TTLS04(I)
      GO TO 32
 3009 DO 3010 I=1,5
 3010 TTLDUM(I)=TTLS05(I)
      GO TO 32
 3011 DO 3012 I=1,5
 3012 TTLDUM(I)=TTLS06(I)
      GO TO 32
 3013 DO 3014 I=1,5
 3014 TTLDUM(I)=TTLS07(I)
      GO TO 32
 3015 DO 3016 I=1,5
 3016 TTLDUM(I)=TTLS08(I)
      GO TO 32
 3017 DO 3018 I=1,5
 3018 TTLDUM(I)=TTLS09(I)
      GO TO 32
 3019 DO 3020 I=1,5
 3020 TTLDUM(I)=TTLS10(I)
```

```
      GO TO 32
3021  DO 3022 I=1,5
3022  TTLDUM(I)=TTLS11(I)
      GO TO 32
3023  DO 3024 I=1,5
3024  TTLDUM(I)=TTLS12(I)
      GO TO 32
3025  DO 3026 I=1,5
3026  TTLDUM(I)=TTLS13(I)
      GO TO 32
3027  DO 3028 I=1,5
3028  TTLDUM(I)=TTLS14(I)
      GO TO 32
3029  DO 3030 I=1,5
3030  TTLDUM(I)=TTLS15(I)
   32 CONTINUE
      IF(III.EQ.IORD) GO TO 34
      DO 33 I=1,5
   33 XTITLE(I)=TTLDUM(I)
      III=IORD
      GO TO 31
   34 CONTINUE
      DO 35 I=1,5
   35 YTITLE(I)=TTLDUM(I)
      WRITE(6,331)(MISSN(I),I=1,18)
      WRITE(6,332)NRCASE
      WRITE(6,333)(XTITLE(I),I=1,18)
      WRITE(6,334)(YTITLE(I),I=1,18)
      DO 40 I=1,NSYS
      ORD(I,1)=VECS(I,IABSC)
   40 CONTINUE
      CALL ORDR(ORD,ABSCA,1,NSYS,1)
      WRITE(6,335)
      DO 45 I=1,NSYS
      KKO=KKORD(I)
      K=KKS(KKO)
      WRITE(6,340)I,ABSCA(I,1),NRCASE,K,(JJS(J,KKO),J=1,7)
      ORD(I,1)=VECS(KKO,IORD)
   45 CONTINUE
      WRITE(6,390)
      IF(IPP.EQ.0) GO TO 55
      WRITE(6,345)
      DO 50 I=1,NSYS
      WRITE(6,350)I,ABSCA(I,1),ORD(I,1)
   50 CONTINUE
   55 CONTINUE
      CALL PLPRCS(ABSCA,N,ORD,NORD,XTITLE,YTITLE,MISSN,IOPPLT,
     INRCASE,NPOWR,IPPLOT)
```

```
          FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
                        (CONTINUED)
      SUBROUTINE PLPRCS(ABSCA,NN,ORD,NORD,XTITLE,YTITLE,GTITLE,IOPT,
     1NCSE,NPOWR,IP)
C     REVISED 23 NOVEMBER 1970
C
C     FOR USE IN PLOT LINK OF FOOD SYSTEM DESIGN PROGRAM
C
      COMMON/AUDATA/IOPAUX,AUXTTL(9)
      DIMENSION ABSCA(2000,1),ORD(2000,1),XTAB(2000),YTAB(2000),NN(1)
      DIMENSION XTITLE(18),YTITLE(18),GTITLE(18)
      IF(IOPT.EQ.0)GO TO 10
      CALL EXTRM(ABSCA,NN,NORD,AAMX,AAMN,LAMX,JAMX,LAMN,JAMN)
      CALL SCLNG(AAMN,AAMX,FAC)
      DO 5 J=1,NORD
      N=NN(J)
      DO 5 I=1,N
    5 ABSCA(I,J)=FAC*ABSCA(I,J)
      CALL SCLMT(AAMN,AAMX,AMN,AMX,IP)
      XLNTH=10.
      GO TO 20
   10 CONTINUE
      N=NN(1)
      AMN=ABSCA(1,1)
      AMX=ABSCA(N,1)
      SFAC=10.**NPOWR
      AMN=AMN*SFAC
      AMX=AMX*SFAC
      IAMN=AMN
      IAMX=AMX
      AMN=IAMN
      AMX=IAMX+1
      AMN=AMN/SFAC
      AMX=AMX/SFAC
      XLNTH=(AMX-AMN)*(10.**NPOWR)
      CALL SCLNG(AMN,AMX,FAC)
      DO 15 J=1,NORD
      N=NN(J)
      DO 15 I=1,N
   15 ABSCA(I,J)=FAC*ABSCA(I,J)
   20 CONTINUE
      CALL EXTRM(ORD,NN,NORD,OOMX,OOMN,LOMX,JOMX,LOMN,JOMN)
      CALL SCLNG(OOMN,OOMX,FAC)
      DO 25 J=1,NORD
      N=NN(J)
      DO 25 I=1,N
   25 ORD(I,J)=FAC*ORD(I,J)
      CALL SCLMT(OOMN,OOMX,OMN,OMX,IP)
      DABSC=(AMX-AMN)/XLNTH
      DORD=(OMX-OMN)/10.
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      CALL SYMBOL(.1,10.,0.14,GTITLE,0.,72)
      IF(NCSE.LE.0) GO TO 32
      CALL SYMBOL(1.,9.75,0.14,16H MISSION NUMBER ,0.,16)
      CASEN=NCSE
      NNMBR=-1
      CALL NUMBER(3.3,9.75,0.14,CASEN,0.,NNMBR)
   32 CONTINUE
      IF(IOPAUX.NE.1) GO TO 33
      CALL SYMBOL(5.,9.75,0.14,AUXTTL,0.,36)
   33 CONTINUE
      CALL AXIS(0.,0.,XTITLE,-72,XLNTH,0.,AMN,DABSC)
      CALL AXIS(0.,0.,YTITLE,72,10.,90.,OMN,DORD)
      K=0
   35 K=K+1
      L=K-1
      KK=MOD(L,14)
      ISYMB=KK
      N=NN(K)
      DO 50 I=1,N
   50 XTAB(I)=ABSCA(I,K)
      XTAB(N+1)=AMN
      XTAB(N+2)=DABSC
      DO 70 I=1,N
   70 YTAB(I)=ORD(I,K)
      YTAB(N+1)=OMN
      YTAB(N+2)=DORD
      IF(IP.EQ.0) GO TO 80
      WRITE(6,95)N
      WRITE(6,100)(XTAB(I),I=1,N)
      WRITE(6,110)(YTAB(I),I=1,N)
      WRITE(6,120)AMN,AMX,XLNTH,OMN,OMX,DABSC,DORD,ISYMB,K
   80 CONTINUE
      CALL LINE(XTAB,YTAB,N,1,1,ISYMB,1.,.05)
      IF(K.LT.NORD) GO TO 35
      XNEW=XLNTH+2.
      CALL PLOT(XNEW,0.,-3)
      RETURN
   95 FORMAT(19H0SUBR PLTPCS   N = I5)
  100 FORMAT(11H XTAB ARRAY/(3X,1F17.8))
  110 FORMAT(11H YTAB ARRAY/(3X,1E17.8))
  120 FORMAT(7H0AMN = E17.8/7H AMX = E17.8/9H XLNTH = E17.8/7H OMN = E17
     1.8/7H OMX = E17.8/9H DABSC = E17.8/8H DORD = E17.8/9H ISYMB = I5/5
     2H K = I5/)
      END
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
C
C     SUBROUTINE EXTRM OBTAINS THE MAXIMUM AND MINIMUM VALUES IN A TWO
C     DIMENSIONAL ARRAY OF DATA
C
      SUBROUTINE EXTRM(A,N,M,AMAX,AMIN,LMAX,JMAX,LMIN,JMIN)
      DIMENSION A(2000,1),N(1)
      AMAX=-1.E30
      AMIN=1.E30
      J=1
    5 L=1
      NP1=N(J)+1
      LP1=2
   30 IF(A(L,J)-A(LP1,J))10,20,20
   10 L=LP1
   20 LP1=LP1+1
      IF(LP1-NP1)30,40,40
   40 IF(AMAX-A(L,J))35,45,45
   35 AMAX=A(L,J)
      LMAX=L
      JMAX=J
   45 L=1
      LP1=2
   50 IF(A(L,J)-A(LP1,J))60,60,70
   70 L=LP1
   60 LP1=LP1+1
      IF(LP1-NP1)50,80,80
   80 IF(AMIN-A(L,J))90,90,100
  100 AMIN=A(L,J)
      LMIN=L
      JMIN=J
   90 J=J+1
      IF(J-M)5,5,110
  110 RETURN
      END
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      SUBROUTINE SCLNG(AMN,AMX,FAC)
      FAC=1.
      ABAMN=ABS(AMN)
      ABAMX=ABS(AMX)
      AMTST=ABAMX
      IF(ABAMN.GT.ABAMX) AMTST=ABAMN
   10 IF(AMTST.LE.1.E5) GO TO 20
      FAC=.1*FAC
      AMTST=.1*AMTST
      GO TO 10
   20 IF(AMTST.GE.1.E-4) GO TO 30
      FAC=10.*FAC
      AMTST=10.*AMTST
      GO TO 20
   30 AMN=FAC*AMN
      AMX=FAC*AMX
      RETURN
      END
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      SUBROUTINE SCLMT(YYMIN,YYMAX,YMIN,YMAX,IP)
C
C     REVISED 22 MAY 1968
C
      QRTR=.25
      THQTR=.75
      IF(IP)750,751,750
  750 WRITE(6,850)YYMIN,YYMAX
  751 DYM=ABS (YYMAX-YYMIN)
      IF(DYM)702,701,702
  701 WRITE(6,800)YYMAX
      IF(YYMAX)731,732,731
  731 DLYYMX=0.1*ABS(YYMAX)
      YYMIN=YYMAX-DLYYMX
      YYMAX=YYMAX+DLYYMX
      GO TO 751
  732 YMIN=-1.
      YMAX=1.
      GO TO 720
  702 DO 703 I=1,36
      TEST=DYM*((10.)**I)
      IF(TEST-1.E9)703,704,704
  704 NBAR=I
      GO TO 705
  703 CONTINUE
      WRITE(6,801)
      GO TO 720
  705 NNBAR=NBAR-9
      SDYM=DYM*((10.)**NNBAR)
      IF(SDYM-5.)706,706,707
  706 SCLTOT=5.
      GO TO 708
  707 SCLTOT=10.
  708 CONTINUE
      IF(SDYM.LT.2.) SCLTOT=2.
      YYMDL=.5*(YYMAX+YYMIN)
      SYYMDL=YYMDL*((10.)**NNBAR)
      ISYMDL=SYYMDL
      SSYMDL=ISYMDL
      FAC=SYYMDL-SSYMDL
      IF(FAC.LT.QRTR) GO TO 709
      SSYMDL=SSYMDL+.5
      IF(FAC.GT.THQTR) SSYMDL=SSYMDL+.5
  709 SYMAX=SSYMDL+.5*SCLTOT
      SYMIN=SSYMDL-.5*SCLTOT
      NNNBAR=-NNBAR
      YMAX=SYMAX*((10.)**NNNBAR)
      YMIN=SYMIN*((10.)**NNNBAR)
```

FOOD SYSTEM DESIGN PROGRAM - PLOTTING LINK
(CONTINUED)

```
      IF(YMAX-YYMAX)730,735,735
735   IF(YMIN-YYMIN)740,740,730
730   SCLTOT=2.*SCLTOT
      IF(SCLTOT.EQ.4.) SCLTOT=5.
      GO TO 709
740   IF(IP)752,720,752
752   WRITE(6,851)DYM,SDYM,NBAR,NNBAR,SCLTOT,YYMDL,SYYMDL,ISYMDL,SSYMDL,
     1FAC,SYMAX,SYMIN,NNNBAR,YMAX,YMIN
720   RETURN
800   FORMAT(35H0YYMAX AND YYMIN ARE BOTH EQUAL TO E17.8/)
801   FORMAT(49H0NUMBER OF ITERATIONS IN DYM LOOP EXCEEDS MAXIMUM/)
850   FORMAT(25H0ENTERED SUBROUTINE SCLMT/10H YYMIN =  E17.8,5X,9H YYMAX
     1 = E17.8/)
851   FORMAT(27H0EXIT FROM SUBROUTINE SCLMT/7H DYM = E17.8,5X,8H SDYM =
     1E17.8,5X,8H NBAR = I10,5X,9H NNBAR = I10/10H SCLTOT = E17.8,5X,9H
     2YYMDL = E17.8,5X,10H SYYMDL = E17.8,5X,10H ISYMDL = I10/10H SSYMDL
     3 = E17.8,5X,7H FAC = E17.8,5X,9H SYMAX = E17.8,5X,9H SYMIN = E17.8
     4/10H NNNBAR = I10,5X,8H YMAX = E17.8,5X,8H YMIN = E17.8/)
      END
```